GOVERNMENT BOTANICAL GARDENS
LIBRARY.
Section.....
No.....

RECORDS

OF THE

BOTANICAL SURVEY OF INDIA

Published by Authority.

VOLUME II—NO. 6.

CALCUTTA:
OFFICE OF THE SUPERINTENDENT OF GOVERNMENT PRINTING, IND A.
1903.

Agents for the sale of Books published by the Superintendent of Government Printing, India, Calcutta.

IN ENGLAND.

E. A. Arnold, 37, Bedford Street, Strand, W. C.
Constable & Co., 2, Whitehall Gardens, S. W.
Sampson Low, Marston & Co., St. Dunstan's House, Fetter Lane, E. C.
Bernard Quaritch, 15, Piccadilly, W.
P. S. King & Son, 2 & 4, Great Smith Street, Westminster, S. W.
Luzac & Co., 46, Great Russell Street, W. C.
Kegan Paul, Trench, Trübner & Co., Charing Cross Road, W. C.
Deighton, Bell & Co., Cambridge.
Williams and Norgate, Oxford.

ON THE CONTINENT.

R. Friedlander & Sohn, 11, Carlstrasse, Berlin, N. W.
Otto Harrassowitz, Leipzig.
Karl W. Hiersemann, Leipzig.
Ernest Leroux, 28, Rue Bonaparte, Paris.
Martinus Nijhoff, The Hague.

IN INDIA.

Thacker, Spink & Co., Calcutta and Simla.
Newman & Co., Calcutta.
S. K. Lahiri & Co., Calcutta.
R. Cambray & Co., Calcutta.
Thacker & Co., Ld., Bombay.
A. J. Combridge & Co., Bombay.
D. B. Taraporevala Sons & Co., Bombay.
Higginbotham & Co., Madras.
V. Kalyanaram Iyer & Co., Madras.
G. A. Natesan & Co, Madras.
Superintendent, American Baptist Mission Press, Rangoon.
Rai Sahib M. Gulab Singh & Sons, Mufid-i-Am Press, Lahore.
Radhabai Atmaram Sagoon, Bombay.
N. B. Mathur, Superintendent, Nazair Kanun Hind Press, Allahabad.

CONTENTS.

	Page.
I. Plants of Chutia Nagpur including Jaspur and Sirguja, by J. J. Wood, M.B., Surgeon Lieutenant-Colonel, I.M.S., retired (issued, 15th August 1902) . .	1—170
II. A Note on plants used during famines and seasons of scarcity in the Bombay Presidency, by G. A. Gammie (issued, 15th August 1902)	171—196
III. Systematic enumeration of the species of Calamus and Dæmonorops, with diagnoses of the new ones, by O. Beccari (issued, 27th September 1902) . .	197—230
IV. Flora of the Sundribuns, by D. Prain (issued, 4th June 1903)	231—370
V. A Census of the Indian Polygonums, by A. T. Gage (issued, 14th September 1903)	371—452
Index to Plants referred to	453—475

LIST OF CONTRIBUTORS.

PAGE.

BECCARI, O. :—Systematic enumeration of the species of *Calamus* and *Dæmonorops*, with diagnoses of the new ones 197

GAGE, A. T. :—A Census of the Indian *Polygonums* 371

GAMMIE, G. A. :—A note on plants used during famines and seasons of scarcity in the Bombay Presidency 171

PRAIN, D. :—Flora of the Sundribuns [with map] 231

WOOD, J. J. :—Plants of Chutia Nagpur including Jaspur and Sirguja [with map and two diagram sections] 1

Agents for the sale of Books published by the Superintendent of Government Printing, India, Calcutta.

IN ENGLAND.

E. A. Arnold, 37, Bedford Street, Strand, W. C.

Constable & Co., 2, Whitehall Gardens, S. W.

Sampson Low, Marston & Co., St. Dunstan's House, Fetter Lane, E. C.

Williams and Norgate, Oxford.

P. S. King & Son, 2 & 4, Great Smith Street, Westminster, S. W.

Luzac & Co., 46, Great Russell Street, W. C.

Kegan Paul, Trench, Trübner & Co., Charing Cross Road, W. C.

Deighton Bell & Co., Cambridge.

B. A. Quaritch, 15, Piccadilly, W.

ON THE CONTINENT.

R. Friedländer & Sohn, 11, Carlstrasse, Berlin, N. W.

Otto Harrassowitz, Leipzig.

Karl W. Hiersemann, Leipzig.

Ernest Leroux, 28, Rue Bonaparte, Paris.

Martinus Nijhoff, The Hague.

IN INDIA.

Thacker, Spink & Co., Calcutta and Simla.

Newman & Co., Calcutta.

Thacker & Co., Ld., Bombay.

Higginbotham & Co., Madras.

V. Kalyanarama Iyer & Co., Madras.

Superintendent, American Baptist Mission Press, Rangoon.

Rai Sahib M. Gulab Singh & Sons, Mufid-i-Am Press, Lahore.

A. J. Combridge & Co., Bombay.

D. B. Taraporevala Sons & Co., Bombay.

PLANTS OF CHUTIA NAGPUR INCLUDING JASPUR AND SIRGUJA.

By J. J. Wood, M.B., Surgn. Lieut.-Col., I M.S., Retired.

INTRODUCTION.

THE area dealt with in the following lists is Chutia Nagpur, including the province so named as at present politically understood, but to this province, as being physiographically part of the same region, we must annex Santalia.

The total area of Chutia Nagpur is 44,000 square miles.[1]

[1] V. Ball. 1880.

The topography of this region is perhaps a little difficult; but if we take one section north and southerly, and another east and west, these will show the elevations and be, I hope, easily understood.

The sections are diagrams and not to scale.

It is only p)lite to start from the capital, and Hooker's "Himalayan Journals"[2] is the best and cheapest* guide from Calcutta as far as Parasnath Hill and the Dunwah pass on the Grand Trunk Road, and on to Rohtasgurh and the Son River. Our east to west section is further south. It shows the rise from Calcutta to Ranigunge collieries, crosses the Damuda there, and passes by the wooded hill of Pachete and rocky Rogonathpur to Purulia.

[2] Chaps. I and II.

From this point the Bāgmūndi hills are seen to the south and Parasnath on the distant north horizon. The section shows a gentle rise to Jhalda, where very fine examples of those striking, domeshaped porphyritic[3] gneiss rocks occur which are characteristic of Chutia Nagpur, particularly here and on the Lohardugga and Hazaribagh plateaus.

[3] V. Ball.

A little further on we cross the Subarnarekha River—river of golden sand—flowing south, and reach Sillee, where there are more of the rounded knobs of gneiss; one group resembling a fist was well named "Knuckles" by Mr. T. F. Peppé.

*It is on sale, illustrations, maps and all, for 10½*d.*, by the Grand Colosseum Warehouse Co., 60 and 70, Jamaica Street, Glasgow, etc.

From Calcutta to Sillee we have been passing through a cultivated country of chiefly rice-land and have not encountered much scrub jungle or forest woodland; but here the jungle proper may be said to begin, as we rise the Lohardugga plateau—the first step up, to two thousand feet—and the road passes through hilly, wooded country until we get to rice-land again at the top. For about twenty miles this wooded ascent continues and wherever the Lohardugga plateau descends to the plains a similar belt of wood is found.

The section now passes through the Lohardugga plateau for between 50 and 60 miles close on the 2,000 level. To the North, a dozen miles off, is seen Bāra Gai, a mountain about 4,000 feet high; and closer to Ranchi are several belt-shaped gneiss hills. As we approach the town of Lohardugga there appears against the western sky a level line which we may call the 3,000 level. North, to the right, it ends in hills which dip into Toree and Palamow, some thousand feet below us, where the Damuda River on the east and the Koel River on the west have their sources. On the south, left, the sky-line seems to go on for ever.

The sides of this plateau are here steeper-looking than the ascent from Sillee to the Lohardugga level. Here we have no continuous table-land like that just passed over or like Hazaribagh, for within these higher lands are wide level valleys at, say, 2 500 feet, reached by passes through the steeper wall. I cannot do better than quote here Dalton's "Descriptive Ethnology of Bengal," page 221 :—

"The country jointly occupied by the Mundas proper and the Oraons extends in a westerly direction to longitude 84° 30′ east, and on reaching that meridian at about latitude 23° 15′ north, we find ourselves in the centre of a dependency of Chutia Nagpur, called Barwah, connected and bounded by the plateau of Chutia Nagpur, Sirguja, and Jashpur, a combination of hill and dale, well-cultivated plains and forest-clad mountains, just suited, to the mixed population that dwell in it."

Arrived in one of these valleys, a still higher level-topped arrangement is observed, with sides densely-clad with jungle. Whereas some hills can attain to flat tops at 3,000 feet—such as Netter Hāt, which boasts to cultivate tea—others carry on higher and closely approach four thousand feet. These, called Pāts, are open plains with a few scattered bushes, and are still more broken up than the 3,000 level. The Jamera Pāt is a good example, and further south the Main Pāt rises to 3,850 feet from the Sirguja Plain, which is about the 2,000 level. It measures 16 miles by 12. The tops of the Pāts, now used as pasturage, were once good hunting ground for Nilgai and Antelope.

I can give no better description of the lie of the Chutia Nagpur plateau than Hooker's, written in 1848,[1] of which the following is a précis. His Parasnath range I take the liberty to call also the Chutia Nagpur plateau; thus—"The Plateau is the north-eastern continuation of that range which crosses the Peninsula from the Gulf of Cambay to Rajmehal. It meets the Kymore about 82° east longitude at Amarkantak—7,000-8,000 feet high,[2] and further west the southern range forms the Satpura. The Parasnath range is the longer of the two, as the north-east Vindhya or Kymore ends at Fort Chunar.

[1] *loc. cit.*

[2] Said to be.

The Kymore consists of sandstone beds overlying limestone, whereas the Parasnath group consists of metamorphic gneiss through which granite protrudes. The Grand Trunk Road as above crosses the east end alone of the range with a very gradual ascent over the alluvial plains of the west of the Hooghly, then over laterite and the sandstone of the coal measures, succeeded by the granitic table-land. A little beyond the coal-field the average height is 1,130 feet, which is continued for upwards of 100 miles to the Dunwah pass. Here the descent, from 1,360 to 620 feet, is sudden to the plains, which continue those of the Ganges up the Son till beyond Rohtasgurh, where the level is under 350 feet.

The Chutia Nagpur plateau differs in its climate and botany equally from the Gangetic plains to the north and from Orissa on the south.

The north and the south section begins at the Ganges, passes through the Rajmehal hills and Santalia to Giridi coal pits, crosses the Barakar river flowing east, and then rises gradually for 20 miles or so to the foot of the hill, then to 4,480 feet at the peak of Parasnath and falls on the south side to about 1,000 feet, the level of Tope Chaney or Doomree, where we may consider ourselves landed upon the Hazaribagh plateau.

This plateau is not so well defined as that of Lohardugga to the south is, and it does not so uniformly approach the 2,000 level. From the base of Parasnath the section rises to Hazaribagh, cutting across the drainage, which all flows to the east, and passing through open country with patches of jungle.

At Hazaribagh, about 2,000 feet, knobs of gneiss appear, and hills, such as Seetagurha and Jūmra where tea is cultivated. Scrub jungle is met with, but most of the ground is open and under cultivation. Between Hazaribagh and the southern edge of this plateau, some five-and-twenty miles, the scrub and other jungle increases in frequency, until it becomes the rule by the roadside, and the well-wooded

Damuda River valley is reached at Ramgurh, quite off the plateau but by no steep ghat. I suppose that 500 feet would cover its height above the sea.

The coal measures are met with here, where they are worked on a small scale. They occur more or less from Ranigunge right up to the source of the river and carry over into Palamow along the Koel basin to be worked on the Son at Dehri. The section now runs through the Bāragai range, which is wooded to the summits at 3,000 to 4,000 feet. Like Parasnath, this range runs east and west. The finest view of the mountain is from the north, for one gets from the north side fuller value, so to speak, because the Damuda valley at about 500 feet is the foreground. The same hill viewed from the south has a foreground of 2,000 feet and is not so grand.

From Ramgurh the country is level and pretty open to the foot of the Lohardugga plateau—5 miles or so. A pretty steep ascent on a bicycle road takes us to Chutu Palu on the top—some 5 miles further. The ghat is as usual jungle and tree-clad and is grand botanical ground. Once on the table-land the story is as before in crossing it from east to west. It is a shallow basin drained by the Subarnarekha river on the east and the South Koel on the west. The Damuda of course takes the northern drainage.

The foundation is gneiss; remarkable examples of the bell structure are seen at Ranchi, also at Lohardugga and Palkot. The country is terraced for rice where the ground is suitable, and in the cold weather dalls, mustard and sirguja are generally cultivated.

Patches of scrub-jungle are passed through, and such trees are in evidence as religion or advantage have saved from the woodman's axe. This continues for some sixty miles, when, after a slight rise the southern lip of the basin is passed over between hills, which here, as usual, edge the plateau—among tree-jungle which accompanies us until the 500-foot level is reached towards Chakardarpur Railway Station in Singbhum and rice-land is again arrived at.

Much of District Manbhum is quite off the plateau, but in the south-west it meets aad mixes with the higher lands of Singbhum and of Lohardugga where, about the 2,000 level, the three districts meet. Much of Singbhum is also on the plains level, but parts of it rise to 2,900 and even 3,500 feet. It is so irregular that I shall not attempt to describe it in detail.

A note on the rivers, in which I follow Hooker, and I have done. The chief rivers from the Chutia Nagpur plateau, the great watershed of Western Bengal, flow north-west or south-east, a few comparatively insignificant streams running north to the Ganges.

Those flowing to the north-west are the Mohun, the Pangun and the North Koel, which feed the Son. Those to the south-east are the South Koel and the Sunk, which unite to form the Brahmani, the Mahanadi—branches—the Subarnarekha and the Damuda.

To the Chutia Nagpur plateau we are indebted for the innumerable lovely rapids and waterfalls which these rivers or their affluents show on every side of it. The finest perhaps is the Hundrughag on the Subarnarekha, not far from Sillee, among charming sylvan scenery. The height of this fall is given as 320 feet."

II.—INDEX TO THE PLANTS OF CHUTIA NAGPUR.

THIS Index to the Plants of Chutia Nagpur is founded on my own collections, mostly and kindly named by Dr. King and Dr. Prain of the Calcutta Herbarium.

It has been put together in hope that it may help botanists, collectors of plants and others interested. For use *practically* in the field, the list is intended to be bound interleaved so as to admit of the necessary additions and corrections.

The explanation of Synonyms is as follows :—

"*Local.*"—Where the native language is doubtful, *e. g.*, Mūndāri, Urāon or Hindī. Mūndāri is closely allied to Santāli.

"*Vern.*"—For vernacular where the language is ascertained, *e.g.*, S. Santāli, B. Bengāli, K. Kōl, H. Hindi.

The Descriptive Catalogue of Economic Products for the London Exhibition of 1886, by the Rev. A. Campbell, annotated by Dr. G. Watt, has been freely made use of. Mr. Campbell's Santāli[1] names of plants have not been *Indexed* in the body of my (catalogue or) Index along with the others, but separately as an appendix to this paper.

(Abelmoschus esculentus, *W. & A.*); Malvaceæ, Hibiscus esculentus, *Linn.*

Local,—Ram turui, ram jingi.

Vern.—Dhenrus, B.

Lady's fingers, Eng.

Abrus precatorius, *Linn.*; Leguminosæ.

Vern.—Arak Kawet, Pond Kawet, S.; (the seeds) Rati, H.

Local,—Karjani.

Abutilon indicum, *G. Don.*; Malvaceæ.

Vern.—Miru baha, S.

Acacia arabica, *Willd.*; Leguminosæ.

Vern.—Gabur, S.

Local,—Babul ;—not a common plant in Chutia Nagpur.

Acacia Catechu, *Willd.*; Leguminosæ.

Local,—Kadir gach, khair, kăt, kătch.

Vern.—Khalyar, S.; Khair, H.

Catechu, Eng.

A neat and pretty hedge, when kept well cut.—*Firminger.*

Note.[1]—I suppose that Mr. Campbell uses "*Kol*" for all the Kolarian languages other than Santali.—J. J. W., August 1899.

Acacia Farnesiana, *Willd.*; Leguminosæ.
Local,—Babul.
Vern.—Gabur, S.

Acacia Intsia, *Willd.*; *Var.* caesia, *W. & A.*; Leguminosæ
Local,—Arar. Kondro janum, S.; Kundaru, K.

Acacia pennata, *Willd.*; Leguminosæ.
Local,—Arai, ? Khardara.
Vern.—Undaru, S.; Arar, Karwar Kundaru, K.

Acacia speciosa. Siris tree (Firminger) appears to be absent from Chutia Nagpur.

Achyranthes aspera, *Linn.*; Amarantaceæ.
Vern.—Chipchirit, S.; Apang, B.
Local,—Chinchiri, tirchiti.

Achimenes, *sp.*; Gesneraceæ.

Achras Sapota, *Linn.*; Sapotaceæ.

Aconitum heterophyllum, *Wall.*; Ranunculaceæ.
Vern.—Atis, the root, H., *q.v.*

Acorns calamus, *Linn.*; Aroideæ.
Vern.—Buch, B.

Acrocephalus capitatus, *Benth.*; Labiatæ.

Adam's needle, Yucca aloifolia, Liliaceæ. Cult. in gardens.

Adenostemma viscosum, *Forst.*; Compositæ.
Local,—Saki.

Adhatoda Vasica, *Nees.*; Acanthaceæ.

Adiantum lunulatum, *Burm.*; Filices.
Local,—Bhui nim, Patal chata.
Vern.—Dodhari, S.

Adina cordifolia, *Hook. f.*; Rubiaceæ.
Local,—Kărăm.
Vern.—Karam, S.; Kurumba, Komba sanko, K.

Ad ka phar; Stereospermum suaveolens, *DC.*; Bignoniaceæ.
Local,—Padar, Papre, Siris (2), (so).
Vern.—Pader, S.

Aeginetia indica, *Linn.*; Orobanchaceæ.
Vern.—Pathu orot, S.

Aegle Marmelos, *Correa.*; Rutaceæ.
Local,—Bel.
Vern.—Sinjo, S.; Bel, H.

Aerides odoratum, *Lour.*; Orchideæ. Got at Sandi-Mandi

Aerua lanata, *Juss.*; Amarantaceæ.
Local,—Jar ka bariari.
Agave americana, *Linn.*; Amaryllideæ.
Vern.—Kantala, Ram Kanta, H. Cult. for fibre near Hazaribagh Jail by Govt.
American aloe, Eng.
Agaricus, *sp.*; Fungi.
Agia; Drosera Burmanni, *Vahl.*; Droseraceæ.
Aglaia undulata, *Miq.*; Meliaceæ.
Agor; Dillenia pentagyna, *Roxb.*; Dilleniaceæ.
Local,—Gulgul, Korkot.
Ailanthus excelsa, *Roxb.*; Simarubeæ.
Local,—Gur Karam.
Air plant; Bryophyllum calycinum, *Salisb.*; Crassulaceæ.
Ajuga macrosperma, *Wall.*; Labiatæ.
Akori; Leea aspera, *Wall.*; Ampelideæ.
Vern.—Hat kan, S.
Alangium Lamarckii, *Thwaites.*; Cornaceæ.
Local,—Dela Kanta.
Vern.—Dhela, S., K., H.
Albizzia Lebbek, *Benth.*; Leguminosæ.
Local,—Siris.
Vern.—Chapot Siris, S.
Albizzia myriophylla, *Benth.*; Leguminosæ.
Vern.—Kanta siris, S., K., H.
Albizzia odoratissima, *Benth.*; Leguminosæ.
Vern.—Jang siris.
Albizzia stipulata, *Boiv.*; Leguminosæ.
Vern.—Chapot kera serom, S.
Alisma reniforme, *D. Don.*; Alismaceæ.
Allamanda, *sp.*; Apocynaceæ.
Allium, *sp.*; Liliaceæ.
Local,—Piaj.
Onion, Eng.
Allmania nodiflora, *Br.*; Amarantaceæ.
Alocasia indica, *Schott.*; Aroideæ. Arum Indicum *Lour.* (Roxb.) Cult. in gardens.
Vern.—Mankanda, Mankachu, B.
Aloysia citriodora, *Ort.*; Verbenaceæ.
Lemon-scented verbena, Eng.; cult. in gardens.
Alstonia scholaris, *Br.*; Apocynaceæ.
Vern.—Chatni, S.; chatan bomudu, K.

Alternanthera sessilis, *Br.*; Amarantaceæ.
Vern.—Garundi arak, S.

Althæa rosea, *Willd.*; Malvaceæ.
Hollyhock, Eng.
Vern.—Gool Khaira, H. Cult. in gardens.

Alu; Solanum tuberosum, *Linn.*; Solanaceæ.
Local,—Aru, Alua.
The Potato.
Potatoes cult. by natives in fields: the leaves and shoots used as sag (vegetable).

Alysicarpus rugosus, *DC.*; Leguminosæ.

Alysicarpus vaginalis, *DC.*; Leguminosæ.
Local,—Angul.

Am; Mangifera indica, *Linn.*; Anacardiaceæ.
The Mango.
Local,—Awm, Ool.
Vern.—Ul, S.; Am, H., B.

Amarantus gangeticus, *Linn.*; Amarantaceæ.
Vern.—Arak gandhari, gandhari arak, S.

Amarantus paniculatus, *Linn.*; Amarantaceæ.
Vern.—Larka baha, S.

Amarantus spinosus, *Linn.*; Amarantaceæ.
Vern.—Janum arak, S.

Amarantus tristis, *Linn.*; Amarantaceæ.
Vern.—Pond gandhari, S.

Amat chingar; Desmodium triflorum, *DC.*; Leguminosæ.
Local,—Chingar Amat.

Amla: see Aonla; Phyllanthus Emblica, *Linn.*; Enphorbiaceæ.

Ammannia baccifera, *Linn.*; Lythraceæ.
Vern.—Dad mari, H.

Ammannia multiflora, *Roxb.*; Lythraceæ.

Ammannia pentandra, *Roxb.*; *var.* fimbriata, *Wight*, and *var.* illecebroides, *Arn.*; Lythraceæ.
Local,—Khet gulab.

Ammannia peploides, *Spreng.*; Lythraceæ.

Amomum melegueta, *Roscoe*; Scitamineæ
Grains of Paradise. Melegueta Pepper.
{ Not known to me as cult. in Chota Nagpur gardens. Watt says "cultivated to a small extent in Indian gardens."

Amoora Rohituka, *W. & A.*; Meliaceæ.
Vern.—Harin hara, Harin khana, H.; Sikru, K.

Amorphophallus campanulatus, *Blume.*; Aroideæ.
Vern.—Zamin kand, Pers. & H.; Ol, S., B.; Kanda, H.

Ampelopsis quinquefolia, *Michx.*—Vitis hederacea, *Ehrb.* Ampelideæ.

Amra; Spondias mangifera, *Willd.*; Anacardiaceæ.
Hog plum of many Europeans: Wild and cult. (Fl. Br. Ind.).

Ananas sativa, *Linn.*; Bromeliaceæ.
The Pineapple.
Local,—Ananas.

Andrographis paniculata, *Nees.*; Acanthaceæ.
The Creat, Eng.
Local,—Charayeta (not *chiretta*).
Vern.—Kalmeg, B., H., S.
"Great confusion between this and Chiretta" proper (Watt.) Ophelia Chireta, *Gris.*

Andropogon (scandens, *L.*); annulatus, *Forsk.*; Gramineæ.

Andropogon (citriodorus, *DC.*); Gramineæ.
(citratus *DC.*) which is A. Schœnanthus, *Linn.*, *q.v.*
Lemon grass, E.
Local,—Bara khera, bharando kher-ghaṇs.

Andropogon contortus, *Linn.*; Gramineæ.
Spear grass, E.
Vern.—Sauri ghas, S.; Khar, Kher, H.
Kher ghans in Chutia Nagpur is not *spear grass* but a large 6-foot plant, whose roots are with difficulty got rid of in cultivation.

Andropogon Gryllus, *Linn.*; Gramineæ.
Local,—Dhori ban.

Andropogon montanus *Roxb.*; Gramineæ.
Local,—Ghora ghans, leringhi ghaṇs.

Andropogon serratus, *Thunb.*; Gramineæ. *Var.* nitidus, *Hack.*
Local,—Phūl, bărhi. Brooms are made of it in Jaspur.

Andropogon Schœnanthus, *Linn.*; Gramineæ. *Var.* versicolor *Hack.*
Vern.—Nanha dhuri ghas, S
Geranium,— Rusa oil, Oil of ginger-grass; Lemon grass.
Local,—Rata ban, Bāra kher, bharando kher-ghaṇs, *v.s.*, Bara kher, etc., also applied to A. citriodorus, *DC.*

Andropogon micranthus, *Kunth.*; Gramineæ. A. capilliflorus (C. & Watt.)

Andropogon pertusus, *Willd.*; Gramineæ.
Vern.—Kada chandi ghas, S.

Andropogon, *sp.*; Gramineæ.

Aneilema nudiflorum, *Br.*; Commelinaceæ.
Angelica glauca, *Edgw.*; Umbelliferæ.
Vern.—Oponom, S.; Chora or Chura, Pb.
Angiopteris evecta, *Hoffm.*; Filices.
Mhowdi Hill, v. v. cult. by T. F. Peppe at Ranchi. Also *tree ferns*, names not got.
Mr. Bournan says the fronds grow to *15 feet* at Mhowdi Hill.
Anisochilus carnosus, *Wall.*; Labiatæ.
Vern.—Gitil ran, S.
Local,—Pipar, chota pipar.
Anisomeles ovata, *Br.*; Labiatæ.
Vern.—Surgi baha, S.
Ankæ, Ankæ daru, Local,—(undetermined). The root bruised with water is applied to *snake-bites*.
Anogeissus acuminata, *Wall.*; Combretaceæ.
Vern.—Gara hesel, pandri, pansi, K.
Anogeissus latifolia, *Wall.*; Combretaceæ.
Local,—Dhaunta.
Vern.—Hesel, S.; Dhawa, K., H.
Anona reticulata, *Linn.*; Anonaceæ.
The Bullock's heart, E.
Vern.—Ram phŭl, H.; Gom, S.
Anona squamosa, *Linn.*; Anonaceæ.
The Custard apple, E.
Vern.—Sitaphŭl, sarifa, sari phŭl, H.; Mandar gom, S.
Anotis calycina, *Hk. f.*; Rubiaceæ.
Anthocephalus Cadamba, *Miq.*; Rubiaceæ.
Local,—Kadam.
Vern.—Sanko, K.
Olim (Nancka C., *Roxb.*)
Antidesma acuminatum, *Wt.*; Euphorbiaceæ.
Antidesma Bunius, *Spreng.*; Euphorbiaceæ.
Local,—Matha.
Antidesma diandrum, *Roth.*; Euphorbiaceæ.
Local,—Mutter sag.
Vern.—Mutta, B.; Matha arak, S.; Antua sag, H.
Antidesma Ghesaembilla, *Gærtn.*; Euphorbiaceæ.
Vern.—Limtoa, B. Umtoa, Hazaribagh; Mata sure, K.
Antigonon leptopus *Hook & Arnu.*; Polygonaceæ.
Sandwich Island Climber, Eng. Cult. in gardens.
Aonla; Phyllanthus Emblica, *Linn.*; Euphorbiaceæ.
Embelic Myrobalan, E.
Local,—also Amla, Amra.

Apium graveolens, *Linn.*; Umbelliferæ.
Vern.—Chanu, B.; Ajmud, H.
Celery, E.

Apluda varia, *Hack.*; *Sub-species* aristata, *Hack.*; Gramineæ.
Vern.—Durhi ghas, S.

Arachis hypogæa, *Linn.*; Leguminosæ.
Earth nut, pea nut.
Vern.—Chine badam, B.

Arai; Acacia pennata, *Willd.*; Leguminosæ.
Vern.—Arar, (2) Karnar; Undaru, S.; Kundaru, (2) K.

Arak Kawet, S.; Abrus precatorius, *Linn.*; Leguminosæ.
Local,—Karjani.
Vern.—Pond Kawet, S.; Rati, H., the seeds.
This is a *Santali word* almost the only one in *my* Index.

Arar (1); Acacia Intsia, *Willd.*; Leguminosæ, *q. v.*
Vern.—Kondro janum, S.; Kundaru, (1) K.
? Local,—Kardara, see also Arai, A. pennata.

Ardisia humilis, *Vahl.*; *var.* arborescens, *Wall.*; Myrsineæ.
Local,—Lilibaha, Mormori.

Areca Catechu, *Linn.*; Palmæ.
Areca nut, Betel nut.
Local,—Sopari.

Argemone mexicana, *Linn.*; Papaveraceæ.
Local,—H. & B. Sial kanta. Gokhula janum, S.
At kuti janum, S.; Ujar kata, H.

Arguni; Phyllanthus Niruri, *Linn.*; Euphorbiaceæ.
Local.—Jiran ban or ban jiran. *Vide* Arjun and Arjuni, *infra.*

(Argyreia) = Lettsomia aggregata, *Roxb.*; Convolvulaceæ.

Argyreia Daltoni, *Clarke*; Convolvulaceæ.
Local,—Chitti.

Argyreia nervosa, *Boj.*; Convolvulaceæ.
Elephant creeper, Eng.

Argyreia speciosa, *Sweet*; Convolvulaceæ.
Vern.—Kedok Arak, S.; Paila sag, H.; Bonpovariya, B.; Watt.
Elephant creeper, Eng.

Arhar; Cajanus indicus, *Spreng.*; Leguminosæ.
Local,—Rahar dall.

Aristida Cumingiana, *Trin. & Rupr.* (capillacea, *Lamk.*); Gramineæ.
Local,—Lud ludi ban.

Aristolochia indica, *Linn.*; Aristolochiæ.
Vern.—Isharmul, H.; Bhedi janetet, S.
Indian birth-wort, Eng.

Arjun ; Terminalia Arjuna, *Bedd.* ; Combretaceæ.
Local,—Arjuni. *Vide* Arjuni, *supra.*
Arjuni ; Vicoa auriculata, *Trin.* ; Compositæ. *Vide* Arjun and Arguni, *supra.*
Arnotto ; Bixa Orellana, *Linn.* ; Bixineæ.
Local,—Anatto.
Vern.—Latkan, H. ; Kong Kuombi, S.
Artemisis parviflora, *Roxb.* ; Compositæ.
Vern.—Bang sing, S.
Artocarpus incisa, *Linn.* ; Urticaceæ.
The Bread Fruit
Vern —Rata del, Singh.
Artocarpus integrifolia, *Linn. f.* ; Urticaceæ.
The Jack fruit.
Local,—Katal, Phatkal, Kanthal.
Vern.—Katol, Panas, H. ; Kanthar, S. ; Poros, K. ; Panasa, Sanskrit.
Artocarpus Lakoocha, *Roxb.* ; Urticaceæ.
Vern.— Dahu, H., S., K. ; Dhau, H.
Aru ; see Alu. The Potato.
Arundinella, *sp.* ; Gramineæ.
Vern.—Buru lukni ghas, S.
Arundo donax, *Linn.* ; Gramineæ.
Vern.—Gaba nul, B.
Asan ; Terminalia tomentosa, *Roxb.* ; Combretaceæ.
Vern.—At'na, Uraon ; Aans, H. (*Roxb*) ; Piasal, usan, B. ; atnak, S ; matnak, K. ; Asan, H.
Asparagus racemosus, *Roxb.* ; Liliaceæ.
H. & Local,—Satawar. Satamuli, Sans. & B.
Asplenium drepanophyllum, *Baker.* ; Filices.
Asplenium oxyphyllum, *Hk.* ; Filices.
Atchkamba ; Ocimum, *sp.* : Labiatæ.
Local,—Achkamba.
Atis ; Aconitum heterophyllum, *Wall.* ; Ranunculaceæ.
Vern.—Atis, atvika,* H. ; Jadvar, Arab.
Not a Chutia Nagpur plant,—*the root* is much used in medicine.
Atkuti-janum, S ; Argemone mexicana *Linn.* ; Papaveraceæ.
Local,—Sial Kanta and H. & B. ; Ujar hata, S.
At'na, Uraon ; Terminalia tomentosa, *Roxb.* ; Combretaceæ.
Local,—Asan, *q. v. supra.*

* Note—Ativisha, Sans. ; *Nir-bishi* (*properly* applied to *poisonous* Aconites), Nepal.

Atylosic mollis, *Benth.*; Leguminosæ.
Local,—Ram kurti.
Vern.—Bir malhan S.
Atylosia scarabaeoides, *Benth.*; Leguminosæ.
Local,—Ban kurti. Bir horek, S.
Avena sativa, *Linn.* *Var.* orientalis; Gramineæ.
Oats, Eng.
Oats are not much cultivated in Chutia Nagpur.
Averrhoa Carambola, *Linn.*; Geraniaceæ.
Local, B. & H. Kămranga.
Cultivated in gardens. The sour variety alone noticed in C. N.
Axinopus cimicinus, *Beauv.* (Panicum cimicinum *Retz.*) Gramineæ.
{Babul; Babula;} Acacia arabica, A. Farnesiana, *q.v.*
Babirung; Embelia robusta, *Roxb.*; Myrsineæ.
Local,—also Sasapora.
Bael; Aegle Marmelos, *Correa.*; Rutaceæ.
Vern.—Sinjo, S.; Bel, H.
Bagberenda; Jatropha Curcas, *Linn.*; Euphorbiaceæ.
Baghur; Capparis horrida, *Linn.*; Capparideæ.
Local,—Bagnei? Bag nahin or "Wait a bit."
Bahera; Terminalia belerica, *Roxb.*; Combretaceæ.
Local,—Bohora, lupun. Lopong, S.; behra, H.
Bahuar; Cordia Myxa, *Linn*; Boragineæ.
Bainsa phūl; Strobilanthes auriculatus, *Nees.*; Acanthaceæ.
Bajra; Pennisetum typhoideum, Gramineæ.
Bakain; Melia Azedarach, *Linn.*; Meliaceæ.
Local,—Belaiti bakain.
Băkleri; Flueggia microcarpa, *Blume.*; Euphorbiaceæ.
(Securinega obovata, *Muell.*)
Băktchi phūl; Lettsomia setosa, *Roxb.*; Convolvulaceæ.
Baliospermum axillare, *Blume.*; Euphorbiaceæ.
Bamboo; Bambusa, etc., *sp.*; Gramineæ.
Local—Bāṇs Katanga, K.; Mak, Mat, S.; Pepesiman, K.
Ban-; Wild or jungli.
Ban, Wild or jungli, is sometimes put *after* the name.
Băn aonla; Phyllanthus Niruri, *Linn.*; Euphorbiaceæ.
Local,—Banjiran, jiran băn, arguni.
Băn aru; Dioscorea glabra *Roxb.*; Dioscoreaceæ.
Băn bhainsa; Fimbristylis ferruginea, *Vahl.*; Cyperaceæ.
Local,—Bhainsa ban.
Băn dudhi, Cephalostigma Schimperi, *Hochst.*; Campanulaceæ.

Băn jatni, —jat'ngi ; Bidens pilosa, *Linn.*; Compositæ.
Ban jira ; Knoxia corymbosa, *Willd.*; Rubiaceæ.
Local—Kakar.
Băn jiran ; Phyllanthus Niruri, *Linn.* ; Euphorbiaceæ.
Local, —Ban aoṇal, arguni, jiran băn.
Băn kājūr ; Phœnix acaulis, *Ham.* ; Palmæ
Băn kapas ; Thespesia Lampas *Dalz. & Gibs.* ; Malvaceœ.
Local,—Kul kudāri.
Ban kundri ; Zehneria Hookeriana, *Arn.* } Cucurbitaceæ.
Zehneria umbellata, *Thw.* }
Ban kūrti ; Atylosia scarabæoides, *Benth.* ; Leguminosæ.
Ban methi ; Crotalaria albida, *Heyne.* ; Leguminosæ.
Ban Munga ; Dalbergia cultrata, *Grah.* ; Leguminosæ.
Ban pāt ; Corchorus olitorius, *Linn.* ; Tiliaceæ.
Jews mallow, E.
Ban pawan ; Not identified.
Local,—Jungli aru.
Ban piāj ; Curculigo, latifolia, *Dryand.* ; Amaryllideæ.
Local,—Kanakanda.
Ban simăr ; Millettia auriculata, *Baker.*; Leguminosæ.
Ban sirsa ; Cleome viscosa, *Linn.*; Capparideæ.
Local,—Iurutia.
Ban sirsu ; Laggera flava, *Benth.*; Compositæ.
Ban toolsi } ; Ocimum gratissimum, *Linn.*; Labiatæ.
Ban tulsi }
Local,—Dimbu phūl, Kala tulsi.
Bana hata ; Stereospermum suaveolens, *D. C.*; Bignoniaceæ.
Local,—Adka phŭr, Padar, Pandar, Papre, Siris.
Banana ; Musa sapientum, *Linn.*; Scitamineæ.
The Plantain.
Local.—Kela.
Banda ; Parasites such as Loranthus, Viscum and Vanda.
Băndăr lathi ; Cassia Fistula, *Linn.*; Leguminosæ.
Bāra dudhi; Holarrhena antidysenterica, *Wall.*; Apocynaceæ.
Holarrhena.
Local,—Bar ki dudhi, Dudhi, koreia.
Vern.—Hat, S., K., H.
Bāra ginjen : Garuga pinnata, *Roxb* ; Burseraceæ.
Local,—Kenkar.
Bāra kher ; Andropogon Schoenanthus, *Linn.*; Gramineæ.
Local,—Bharando kher.
Andropogon citriodorus, *DC.*

Bărángi ; Oxalis corniculata *Linn.*; Geraniaceæ.
Barango ; Conyza ? stricta, *Willd.*; Compositæ.
(C. absinthæfolia, *DC.*; Japonica, *Less.*; veronicæfolia *Wall*)
Barbaria ; Spilanthes Acmella, *Linn.*; Compositæ.
Barkanda ; see Bŭrkūnda.
Barkidudhi ; see Băra dudhi.
Barleria cristata, *Linn.*; Acanthaceæ.
Local.—Gokura.
Barleria Prionitis, *Linn.*; Acanthaceæ.
Vern.—Kanta phul, S.
Barleria strigosa, *Willd.*, Acanthaceæ.
Vern —Reila baha, S.
Barringtonia acutangula, *Gærtn.*; Myrtaceæ.
Vern.—Hingol, hinjor, S.; Saprung, K.
Basella rubra, *Linn* ; Chenopodiaceæ.
Local —Chota pui ság.
Bassia latifolia ; *Roxb.*; Sapotaceæ.
Local,—Mahua.
Vern.—Matkom, S.; Mandukum, K. ; Mahul, B.
Bauhinia acuminata, *Linn.*; Leguminosæ.
Local,—Kaimo.
Vern.—Kachnar. H.; Kanchan, B.
Mountain Ebony, E.
Bauhinia racemosa, *Linn.*; Leguminosæ.
Vern.—Kachnal, H.; Kaimu, K.; Gotouli, Oraon ; Katmauli, Loh.
Bauhinia retusa, *Ham.*; Leguminosæ.
Vern.—Jinjit, S., Kandla, semla, H.; Kaimu, Loh ; Laba, K.; Twar, Oraon ; Tewar, Pal.
Local,—Kăchnār.
The flowers are eaten, Sitonga Jaspur.
Bauhinia tomentosa, *Linn.*; Leguminosæ.
Vern.—Kachnar, H.
Bauhinia Vahlii, W. & A. ; Leguminosæ.
Local,—Chope, the bark. Jom, S. ; Lama rung, K. ; Maljan &c., H.
Bauhinia purpurea, *Linn.*; Leguminosæ.
Local,—Kuinuar and Kacoar.
Vern.—Kaniar, H. ; Koiral, B.; Singyara, S.; Buruju, K.; Koinar, Lohardugga.
Bauhinia variegata, *Linn.* ; Leguminosæ.
Vern.—Kachnar, Kaniar, H. ; Jingya, Jinjir, S. ; Singya, K. ; Kundol, Bhumji ; Rakta Kanchan, B.

Beal ; Pterocarpus Marsupium, *Roxb.* ; Leguminosæ.
Bean ; Faba vulgaris. Vicia Faba, *Linn.* ; Leguminosæ.
Haricot kidney Bean. Paras Bean, Local.—Phaseolus vulgaris, *L.*
Beaumontia grandiflora, *Wall.* ; Apocynaceæ.
Begonia picta, *Sm.* ; Begoniaceæ.
Vern.—Dhiri jhapak, S.
Bel ; Aegle Marmelos, *Correa.* ; Rutaceæ.
Local,—Bael.
Vern.—Sinjo, S.
Belati ; *adj.* English ; *so* B. bakain, B. bengan.
Belati bakain ; Melia Azedarach, *Linn.* ; Meliaceæ.
Local,—Bakain.
Belati bengan ; Solanum Melongena, *Willd.* ; Solanaceæ.
Belwa ; Semecarpus Anacardium, *Willd.* ; Anacardiaceæ.
Local, & S.,—Soso.
Belwa lung ; Cordia Macleodii, *H. f. & T.*, Borragineæ.
Bende ; Panicum antidotale, *Retz.* ; Gramineæ.
Local,—Bere.
Bendo ; (1) Spatholobus Roxburghii, *Bth.* ; Leguminosæ.
Bendo ; (2) Pueraria tuberosa, *DC.* ; Leguminosæ.
Bengan ; Solanum longum, *Roxb.* ; Solanaceæ.
Local,—Brinjal, Belati bengan.
The egg plant.
Bengadaru ; Grewia tiliæolia, *Vahl.* ; Tiliaceæ.
Benguria ; Eclipta alba, *Hassk.* ; Compositæ.
Benincasa cerifera, *Savi.* ; Cucurbitaceæ.
The White Gourd Melon.
Vern.—Gol Kadu, H. ; Kumra, chal komra, B.
Bera kanda ; Hibiscus cancellatus, *Roxb.* ; Malvaceæ.
Bere ; Panicum antidotale, *Retz.* ; Gramineæ.
Local,—Bende.
Beri ; Casearea tomentosa, *Roxb.* ; Samydaceæ.
Beri lat ; Triumfetta rhomboidea, *Jacq.* ; Tiliaceæ.
Betel nut ; see Areca.
Bhainsa ban ; Fimbristylis ferruginea, *Vahl.* ; Cyperaceæ.
Bharando kher ; Andropogon Schoenanthus, *Linn.* ; Gramineæ.
Local,—Bara kher. Rata-bân. Nana dhuri ghas, S.
Bharo pochi ; Elytrophorus articulatus, *Beauv.* ; Gramineæ.
Bhawat ; Eriolæna spectabilis, *Planch.* ; Sterculiaceæ.
Bherendi ; Sporobolus diander, *Beauv.* ; Gramineæ.
Bhita-Chonoria ; Rivea ornata, *Chois.* ; Convolvulaceæ.

Bhui nim; Adiantum lunulatum, *Burm.*; Filices.
Bhŭr Khŭnd; Hymenodictyon excelsum, *Wall.*; Rubiaceæ.
Local,—Burkund.
Vern.—Bhor kond, S.
Bhurundi ban; Ischæmum ciliare, *Retz.*; Gramineæ.
Bhuseri; Siegesbeckia orientalis, *Linn.*; Compositæ.
Bhut raj; Lygodium scandens, *Sw.*; Filices.
Bichra (1); Grewia salvifolia, *Heyne.*; Tiliaceæ.
Bichra (2); Kydia calycina, *Roxb.*; Malvaceæ.
Vern.—Posta olak, S.; Pala dhamin, K.
Dhamin is applied to wood suitable for Banghy sticks—J.J.W.
See Grewia, a green hedge plant like Dodonæa in leaf, from Delhi or up country cult.
Bichua. Not determined.
Local,—Kaptin, Bichua.
Bidens pilosa, *Linn.*; Compositæ.
Local,—Ban jatni.
(Bignonia) now Oroxylum indicum, *q.v.*
Bignonia venusta, *Ker-Gawl.*; Bignoniaceæ.
Cult. exotic, common. Not in *Fl. Brit. Ind.*
Bilei gori; Leucas mollisima, *Wall.*; Labiatæ.
Biophytum sensitivum, *DC.*; Geraniaceæ.
Bitchua; Bichua, *q.v.*; not determined.
Local,—Bichua, Kaptin.
Somewhat like Dodonæa in leaf. *cf.* Ficus Sp.
Bixa Orellana, *Linn.*; Bixineæ.
Local,—Anatto-Arnotto, Eng.
Local,—Latkan; Cult.
Vern.—Kuog kuombi, S.
Blumea fasciculata, *DC.*; Compositæ.
Vern.—Rondoc, S.
Blumea glomerata, *DC.*; Compositæ.
Vern.—Gada pach wani, S.
Blumea lacera, *DC.*; Compositæ.
Var. a C. B. Clarke. canescens, *Hk. f.*
Vern.—Kakronda, jungli muli, H., Kukursunga, B.
Bœrhaavia diffusa, *Roxb.*; Nyctagineæ.
Bombax malabaricum, *D.C.*; Malavaceæ.
Silk cotton tree, E.
Local,—Simal, Simar. W. Ind. Ceiba. Edel, S.
Bonnaya brachiata, *Link & Otto.*; Scrophularineæ.

Borassus flabellifer, *Linn.*; Palmeæ.
Local,—Targach, Tal, Tari.
Fan or toddy-palm, E.
Boswellia serrata, *Roxb.*; Burseraceæ.
Local,—Sally, salei. The gum,—Lobān.
Olibanum, E.
Salga, S., H., K.
Bowr; Ficus retusa, *Linn.*; Urticaceæ.
Local,—Buru hesa.
The aerial roots from the branches become stringy and long and fine below. I saw no instance of their forming *supports* such as the *Būr* tree Ficus bengalensis has.
Brahmini; Desmodium polycarpum, *DC.*; Leguminosæ.
Local,—Karangi, karjani.
Brassica species, cultivated; Cruciferæ.
Cabbage, cauliflower, knol khol, Eng.
Local,—Kūbi, phūl kūbi, gol. kūbi.
Olim (Sinapis), *e.g.*, (S. alba) and (nigra).
Local,—Rai; ? turi. Turnip, E.
Local,—Sŭlgŭm.
Brassica campestris, *Linn.*; Cruciferæ.
Vern.—Lutni, thadia turi, S.
Brassica juncea, *H. f. & T.*; Cruciferæ.
Local,—Rai. Mustard, E.
Vern.—Rai, S.
Breynia patens, *Benth.* (Melanthesopsis patens, *Muell.*); Euphorbiaceæ.
Breynia rhamnoides, *Muell.*; Euphorbiaceæ.
Vern.—Kadrupala, karki, S.
Bridelia retusa, *Spreng.*; Euphorbiaceæ.
Local,—Kari, kasei, kawj.
Bridelia tomentosa, *Blume*; Euphorbiaceæ.
Brinjal; Solanum *species*; Solanaceæ.
Local,—Bengan.
Egg plant, Eng.
Solanum Melongena, *Linn.*; S. longum, *Roxb.*
Bryonia laciniosa, *Linn.*; Cucurbitaceæ.
Bryophyllum calycinum. Crassulaceæ.
Air-plant, E. Flrs. pale green tinged with red (Firminger).
Buchanania latifolia, *Roxb.*; Anacardiaceæ.
Local,—Pial pāti, Peyār.
Buchnera hispida, *Ham.*; Scrophularineæ.

Buettneria herbacea, *Roxb.* ; Sterculiaceæ.
Vern.—Diku Sindur, kambraj, S.
Bougainvillea spectabilis, *Willd.*; Nyctagineæ. Cult.
Buktchi phūl; Lettsomia setosa, *Roxb.*; Convolvulaceæ.
Bupleurum falcatum, *Linn.*; Umbelliferæ.
Būrkūnd; Hymenodictyon excelsum, *Wall.*; Rubiaceæ.
Vern,—Bhor Kond, S.
Burmannia cœlestis, *Don.*; Burmanniaceæ.
Com. in moist situations. Stem very hairy, flowers dark blue (C. & W.).
Bur'ndo ghans; Panicum colonum, *Linn.*
Bŭrra; Băra means greater or the large one.
Local,—Burka.
Thus, Barra gingen; Garuga pinnata, *Roxb.*
Bursera serrata, *Colebr.*; Burseraceæ. *Wall.*
Vern,—Armu, S.
Bursi. Not determined.
Buru hesa; Ficus retusa, *Linn.*; Urticaceæ.
Local,—Bowr.
Burui; Gardenia gummifera, *Linn. f.*; Rubiaceæ.
Butea frondosa, *Roxb.*; Leguminosæ.
Local,—Pălas, părās, murut.
Vern,—Murup, dare murup, S.; Dhak, B.
(Butea superba, *Roxb.*) is the same species, only scandent.
Local,—Palas, paras. Nari murup, S.
Butomopsis lanceolata, *Kunth.*; Xyrideæ.
Local,—Kui phūl.
Cæsalpinia Bonducella, *Fleming*; Leguminosæ.
Cæsalpinia Coriaria, *Kth.*; Leguminosæ.
Not a native of Brit. India; A S. American plant.
Cæsalpinia, pulcherrima *Sw.*; Leguminosæ.
Olim (Poinciana p. *Linn.*) Cult. Common in gardens.
Cæsulia axillaris, *Roxb.*; Compositæ.
Local,—Ghetia, kena.
Cajanus indicus, *Roxb.*; Leguminosæ.
Local,—Rahar dall.
Vern.—Raher S.; Laher H.; Oroha, B.
Dall-pulse. Cult. Three varieties of Cajanus indicus, *viz.*, Maghi, ripe in January; Chaitati, ripe in March; Aghauni, ripe in November.
Callicarpa arborea, *Roxb.*; Verbenaceæ.

Callicarpa macrophylla, *Vahl.;* Verbenaceæ.
Vern.—Budhi ghasit, S.
Callistemon linearis, *DC.*; Myrtaceæ. Terai Callistemon.
Calotropis gigantea, *Br.;* Asclepiadeæ.
Local,—Mădar, Phatli.
Vern.—Akauna, S.
Camellia theifera, *Griff.* Ternstroemiaceæ.
Tea, Eng.
Local,—Cha.
Camellia Thea, *Link.;* is the *earliest* name.
The tea plant or bush. Cultivated at Seetagunha near Hazaribagh, at 2,000 feet.
Canavalia ensiformis, *DC.;* Leguminosæ.
Vern.—Tihon, S.
Canna indica, *Linn.;* Scitamineæ. Cult.
Canscora decussata, *DC.;* Gentianaceæ.
Canscora diffusa, *R. Br.;* Gentianaceæ.
Canthium didymum, *Roxb.;* Rubiaceæ.
Vern.—Garbha gojha, S.
Capparis horrida, *Linn.;* Capparideæ.
Local,—Bag nahin. Buru asaria, S. Cult.
Capsicum frutescens, *Linn.;* Solanaceæ.
Local,—Lal meritch.
Chili, pepper, capsicum, Eng.
Captin, *vide* Kaptin; undetermined.
Local,—Kaptin, Bītchua.
A green hedge, like Dodonæa. Cult. from Delhi or up country; not collected; seen as hedge two to three feet high near Juspurnagar, 2,000 or 2,500.
Cardiospermum Halicacabum, *Linn.;* Sapindaceæ.
Local,—Gal phuli.
Vern.—Putki malla, S.
Careya arborea, *Roxb.;* Myrtaceæ.
Local,—Kumhi.
Vern.—Kumbir, S., K., H.
Carica Papaya, *Linn.;* Passifloreæ.
Local,—Papita.
Papaw, E. Exotic.
Carissa Carandas, *Linn.;* Apocynaceæ,
Local,—Kărănda. Karwak janum, S.
Carissa spinarum, *A. DC.;* Apocynaceæ.
Local,—Garsul, Kărănda, Koronda, Kărŭnda, Carŭnda.

Carissa diffusa, *Roxb.* "A state of Carissa Carandas, *Linn.*" *so Brandis.*

Carthamus tinctorius, *Linn.;* Compositæ.
Local,—Kūsūm (1).
Safflower, Eng.
Used as a dye. Cult. Another Kūsūm (2) is Schleichera trijuga, *Willd.;* Sapindaceæ.

Carŭnda; Carissa *species;* Apocynaceæ.
Local,—Kŭrŭnda.

Casearea tomentosa, *Roxb.;* Samydaceæ.
Local,—Beri, corcho, ride, S.; Bong corcho, K.

Cassia Fistula, *Linn.;* Leguminosæ.
Local,—Amaetas, Bandar lathi.
Vern.—Nuruic, S.
Umaltâs, Pudding-pipe. Tree (Firminger) Bandar lowri, local.

Cassia glauca, *Lamk.;* Leguminosæ.
Var. suffruticosa, *Kœnig.*
Vern.—Bheda dereng, S.

Cassia mimosoides, *Linn.;* Leguminosæ.
Local,—Masturia, Masuria, Patwa ghas, S.; Chota aura, H.; Otleondro? S.

Cassia Tora, *Linn.;* Leguminysæ.
Vern.—Chakooda arak, S.

Cassytha filiformis, *Linn.;* Laurineæ.
Vern.—Alag jari, S.

Catechu; see Acacia catechu,—and Kut.

Cedrela Toona, *Roxb.;* Meliaceæ.
Local,—Tooni.
Vern.—Alga-jari, S.

Celastrus paniculata, *Willd.;* Celastrineæ.
Local,—Kujili.
Vern.—Kujri, S. & H.

Celosia argentea, *Linn.;* Amarantaceæ.
Local,—Siliari.
Vern.—Sirgit arak, S.

Centipeda orbicularis, *Lour.;* Compositæ.
Vern.—Bedi achim, S.

Centranthera hispida, *Br.;* Scrophularineæ.

Centunculus tenellus, *Duby.;* Primulaceæ.

Cephalostigma hirsutum, *Edgew.;* Campanuiaceæ.
Cephalostigma Hookeri, *Clarke ;* Campanulaceæ.
Cephalostigma Schimperi, *Hochst. ;* Campanulaceæ.
Local,—Băn dudhi, dudhi bān.
Ceratopteris thalictroides, *Brong ;* Filices.
Chal ; Shorea robusta, *Roxb. ;* Dipterocarpeæ.
Local,—Săkua, sāl, sarei, sarjŭm, sarjom, S. ; Sakhua, sal, H.
Chămpa, (1) ; Michelia Champaca, *Linn. ;* Magnoliaceæ.
Champa, (2) ; Plumeria acutifolia, *Poir. ;* Apocynaceæ.
Champa (2) is often used locally for *Plumeria*, which is properly *Gulainchi*, Local.
Chapka ; Selaginella rupestris, *Spring ;* Loycopodiaceæ.
Chara fœtida, *A. Br. ;* Characeæ.
Charayeta ; Andrographis paniculata, *Nees ;* Acanthaceæ.
The "*Creat*" Mulubai, Kulmeg, B., H., S.
Not *chiretta*, (Ophelia chireta, *Roxb.*) but used for it.
Chătian ; Microrhynchus divaricata ; Composïtæ.
Scorzonera divaricata, *Turoz.*
Cheilanthes farinosa, *Kaul. ;* Filices.
Local,—Pătăl chatta.
Vern.—Nanha, dodhari, S.
Cheilanthes tenuifolia, *Sw. ;* Filices.
Chenopodium album, *Moq. ;* Chenopodiaceæ.
Vern.—Bhatua arak, S. ; Khartua sag, H.
Cheri gora ; Pavetta indica, *Linn. ;* Rubiaceæ.
Local,—Indirjow, Menda. Andirjow.
Another Indirjow is Nerium antidysentericum, now Holarrhena, *Wall.*
Cheur ; Homonia riparia, *Lour. ;* Euphorbiaceæ.
Chikni ; Glochidion lanceolare, *Dalz. ;* Euphorbiaceæ.
Chimti ka sag.? ? ?
Local,—Păgŭla.
Chinchiri ; Achyranthes aspera, *Linn. ;* Amarantaceæ.
Local,—Tirchiti.
Vern.—Chipchirit, S.
Chingar amat ; Desmodium triflorum, *DC. ;* Leguminosæ.
Local,—Amat chingar.
Chiryta ; Holoptelea integrifolia, *Planch. ;* Urticaceæ.
(Ulmus integrifolia, *Roxb.*)

Chitchiri ; Diospyros melanoxylon, *Roxb.* ; Ebenaceæ.
Local,—Khend, Tiril.
Vern.—Terel, S.
A bonfire of Khend makes beautiful *Bengal fire.*
Chitour ; Justicia Betonica, *Linn.* ; Acanthaceæ.
Local,—Chitaor.
Chitti ; Argyreia Daltoni, *Clarke* ; Convolvulaceæ.
Chloris *sp.* ; Gramineæ.
Cholorophytum *sp.* ; Liliaceæ.
Chota brahmini ; Euphorbia dracunculoides, *Lamk.* ; Euphorbiaceæ.
Chota dudhi ; Ichnocarpus frutescens, *Br.* ; Apocynaceæ.
Local,—Guri lerung.
Chota pui sag ; Basella rubra, *Linn.* ; Chenopodiaceæ, includes (Basella alba, *Linn.* ; and also *Roxb.*)
Chota pipar ; Anisochilus carnosus, *Wall.* ; Labiatæ.
Choulra ; Bombax malabaricum, *DC.* ; Malvaceæ.
Silk cotton tree ; Ceiba, W. Indies.
Local,—Simăl, Simar.
Vern.—Edel, S. ; Simal, Simur, K., H.
Chrozophora plicata, *A. Juss* ; Euphorbiaceæ.
Vern.—Pangs nari, S.
Chrysanthemum indicum, *D.C.* ; Compositæ.
Chrysanthemum coronarium, *Linn* ; Compositæ.
Chrysanthemum indicum, *Linn* ; Compositæ.
Chūnki ; Asplenium oxyphyllum, *Hk.* ; Filices.
Cicer arietinum, *Linn.* ; Leguminosæ.
Local,—Būt, chenna.
Vern.—Būt, S., H.
Cissampelos Pareira, *Linn.* ; Menispermaceæ.
Local,—Parhi.
Vern.—Tejo malla, S.
Cleisanthus collinus, *Benth* ; Euphorbiaceæ.
Vern.—Kangalli, S.
Clematis nutans, *Royle* ; Ranunculaceæ.
Vern.—Bonga Khanti, S.
Cleome monophylla, *Linn.* ; Capparideæ.
Vern.—Hurhura (potherb), Kedar jhawar (medicine), S.
Cleome viscosa, *Linn.* ; Capparideæ.
Clerodendron infortunatum, *Linn.* ; Verbenaceæ.
Vern.—Barni, Varni, Kharbari, S.

Clerodendron phlomoides, *Linn. f.*; Verbenaceæ.
Vern.—Pan jot, S.

Clerodendron serratum, *Spreng.*; Verbenaceæ.
Vern.—Saram lutur, S.

Clerodendron Siphonanthus, *R. Br.*; Verbenaceæ.
Local,—Parola.

Clerodendron Thomsoni. Verbenaceæ; Cult.

Clitoria ternatea, *Linn*; Leguminosæ.
Mussel shell creeper, E.

Cocculus villosus, *DC.*; Menispermaceæ.

Cochlospermum Gossypium, *DC.*; Bixineæ.
Local,—Sisi baha, ūdŭl.
Vern.—Hopo, S.; Galgal, K. and H.

Coffea arabica, *Linn*; Rubiaceæ.
Local,—Kaphè.
Cultivated first on a large scale at Seetagarha,—unsuccessfully, now a few bushes near bungalows is the rule.

Coix Lachryma-Jobi, *Linn.*; Gramineæ.
Vern.—Jargadi, S.
Job's tears, E.
Coix gigantea, *Koen.* = Coix Lachryma-Jobi, *Linn.*

Colebrookia oppositifolia, *Smith.*; Labiatæ.
Vern.—Bursa pakor, Bhainsa, S.

Colocasia antiquorum, *Schott.*; Aroideæ.
Local,—Katchū.

Combretum decandrum, *Roxb.*; Combretaceæ.
Local,—Gorŭnda.
Vern.—Aten, S.

Commelina benghalensis, *Linn.*; Commelinaceæ.
Vern.—Kana arak, S.

Commelina salicifolia, *Roxb.*; Commelinaceæ.

Commelina suffruticosa, *Bl.*; Commelinaceæ.
Vern.—Dare orsa, S.

(Conocarpus) = Anogeissus latifolia, *Wall.*; Combretaceæ.
Local,—Dhaunta.
Vern.—Hesel, S.; Dhawa, K. and H.

Convolvulus pentanthus, *Jacq.* (Ipomæa semperflorens Firminger.) Cult.

Convolvulus pluricaulis, *Chois*; Convolvulaceæ.

Conyza (absinthifolia, *DC.*) = stricta, *Wall.*; Compositæ.

Corchorus capsularis, *Linn.*; Tiliceaæ.
The Jute of commerce. Ghinalta pat, B.
Not cultivated in C. N. that I know of.

Corchorus olitorius, *Linn.*; Tiliaceæ.
Vern.—Jute (2), pāt, bānpāt, B.
Jew's mallow, E.
(Putto, Sans. Pat, B. *Roxb.*)

Corchorus *sp.*; Tiliaceæ.
Vern.—Bir narcha, S.
Leaves used as a potherb (Campbell and Watt).
A 3rd Jute = Crotalaria juncea.

Cordia Macleodii, *Hk. f. & T.*; Borragineæ.
Local.—Belwa lung.
Vern.—Jugia, S.

Cordia Myxa, *Linn.*; Borragineæ.
Local,—Bŭch.
Vern.—Buch, S.

Costus speciosus, *Sm.*; Scitamineæ.
Vern.—Orop, S.

Cotton; Gossypium herbaceum, *Linn*; Malvaceæ.
Vern.—Kăpās, H., Cotton wool, Rui.

Cowhage; Mucuna pruriens, *DC.*; Leguminosæ.
Local,—Keinli.

Crinum *sp.*; Amaryllidaceæ.
Vern.—Sikyom baha, S.
"The root is the size of a good-sized turnip." (Camp.)

Crotalaria alata, *Ham.*; Leguminosæ.
Vern.—Marangjhunka, S.

Crotalaria albida, *Heyne.*; Leguminosæ.
Local,—Ban methi.

Crotalaria calycina, *Schrank.*; Leguminosæ.
Vern.—Mota bir jhunka, S.

Crotalaria juncea, *Linn.*; Leguminosæ.
Local,—Sŭnpāt; jute (3).
Vern.—Sŭn, B.

Crotalaria prostrata, *Roxb.*; Leguminosæ.
Local,—Jinjănia.
Vern.—Katio-jhunka, nanha jhunka, S.

Crotalaria striata, *DC.*; Leguminosæ.
Vern.—Sonjhunka, S.; son, san, H.

Croton oblongifolius, *Roxb.*; Euphorbiaceæ.
Local,—Pūtri.
Vern.—Gote, S.; poter, K.
A strong element in scrub jungles—usually.

Cryptolepis Buchanani, *R. & S.*; Asclepiadeæ.
Vern.—Utri dudhi, S.

Cryptostegia grandiflora, Br., Asclepiadaceæ.
Vern.—Chaluk Churi.
A large climber ; large purple flrs. Hazaribagh garden. Cult.
Cucumis Melo, *Linn.;* Cucurbitaceæ.
Cucumber, E. Local, Kădū.
Vern.—Tarbūj, S. Cult.
Curculigo latifolium, *Dryand.;* Amaryllideæ.
Local,—Kawa Kanda.
Curcuma (cordata, *Wall.*) ; Scitamineæ.
Vern.—Sar'nga, S.
Curcuma, *sp.;* Scitamineæ.
Vern.—Bir sasang, orsorin, S.
Curcuma longa, *Linn.;* Scitamineæ.
Turmeric, Eng.
Vern.—Hŭldi, H. & B. Cultivated.
Curcuma petiolata, *Roxb.;* Scitamineæ.
Cuscuta chinensis, *Lamk.;* Convolvulaceæ.
Cuscuta reflexa, *Roxb.;* Convolvulaceæ.
Cutch ; Acacia Catechu, *Willd. q.v.;* Leguminosæ.
Vern.—Alag jare, S.
See kăt Khaijars-Khair, H.
Catechu, Eng.
Cyamopsis psoralioìdes, *DC.* Leguminosæ.
Vern.—Buru raher, S. Cultivated.
Cyanotis axillaris, *R. & S.;* Commelinaceæ.
Cyanotis cristata, *Schultes f.;* Commelinaceæ.
Cyanotis tuberosa, *Schultes f.;* Commelinaceæ.
Vern.—Merom chunchi, sim dochok, hodo jereng arak, S.
Cyathocline lyrata, *Cass.;* Compositæ.
Local,—Chikni.
Vern.—Bereng phul, S.
Cynodon dactylon, *Pers.;* Gramineæ.
Vern.—Dhobi ghans, H., dhub ghans, S.
Cynoglossum denticulatum, *A. DC.;* Boragineæ.
Vern.—Parwa cetchirip, parwa lata, S.
Cyperus alopecuroides, *Roxb.;* Cyperaceæ.
Cyperus distans, *Linn. f.;* Cyperaceæ.
Cyperus Iria, *Linn.;* Cyperaceæ.
(Cyperus) Juncellus lævigatus, *Clarke.;* Cyperaceæ.
Cyperus niveus, *Retz.;* Cyperaceæ.
Vern.—Bir Mutha, S.
Cyperus (pumilus, *Linn.*) ; Cyperaceæ.

Cyperus rotundus, *Linn.*; Cyperaceæ.
Vern.—Tandi sura, Mutha, S.
Cyperus tegetum, *Roxb.*; Cyperaceæ.
Vern.—Sura, S.
Dædalacanthus nervosus, *T. Anders.*; Acanthaceæ.
Dædalacanthus purpurascens, *T. Anders.*; Acanthaceæ.
Dahu; A large yellow-leaved tree.
Dak dawa, Oroxylum indicum, *Bth.*; Bignoniaceæ.
Vern.—Banàhatak, S.; Bhal supti, H.
Local,—Gingen, sicat.
Dalbergio cultrata, *Grah.*; Leguminosæ.
Local,—Ban munga.
Dalbergia lanceolaria, *Linn.*; Leguminosæ.
Vern.—Chapot siris, chapot, S.
Dalbergia latifolia, *Willd.*; Leguminosæ.
Local,—Pandan.
Vern.—Sat sayar, S.
Dalbergia Sissoo, *Roxb.*; Leguminosæ.
Local,—Sissu, shishăm; common as timber in bazar; much used in carpentry.
Dalbergia volubilis, *Roxb.*; Leguminosæ.
Vern.—Bir Munga, narisiris, S.
Dall; Purse; see Kesāri, Rahar, Mung.
Damin; Banghy-stick wood; see Grewia and Kydia.
Vern.—Dhamin, K., *q. v.*
Daru; tree, and bili; bush, in Kol.? arak, S.
Datura Stramonium, *Linn.*; Solanaceæ.
Local,—Dhatura.
Datura fastuosa, *Linn.*; Solanaceæ.
Vern.—Dhatura, S. and H.
Dawai-banda; Loranthus Scurrula, *Linn.*; Loranthaceæ.
Dawei; Woodfordia floribunda, *Salisb.*; Lythraceæ.
Local,—Dhaiphul, Dhawei, Dhowra.
Vern.—I chak, S.; *Olim* (Grislea tomentosa, *Roxb.*).
Debdaru; Polyalthia longifolia, *Benth.* & *Hk. f.*; Anonaceæ.
Local,—Deodar.
Vern.—Deodar, K. cult. Planted as Avenue—Dorunda.
Dela Kunta (1); Alangium Lamarckii, *Thwaites.*; Cornaceæ.
Local,—Dila, dila kanta.
Dendrobium bicameratum, *Lindl.*; Orchideæ.
Dendrobium crepidatum, *Lindl.*; Orchideæ.
Dendrobium formosum, *Roxb.*; Orchideæ.

Dendrobium herbaceum, *Lindl.*; Orchideæ.
Dendrobium macrostachyum, *Lindl.*; Orchideæ.
Dendrobium moschatum, *Wall.*; Orchideæ.
Dendrobium = calceolaria, *Carey.*; Orchideæ.
Dendrobium regium, *Prain.*; Orchideæ.
Dendrobium transparens, *Wall.*; Orchideæ.
Dendrocalamus strictus, *Nees.*; Gramineæ.
Local,—Bans.
Bamboo, E.
Vern.—Buru mat, S., K.; Bans, H.
Denri; Eriolæna Hookeriana, *W. & A.*; Sterculiaceæ.
Deodar; see above, Debdaru.
Desmodium Cephalotes, *Wall.*; Leguminosæ.
Vern.—Bir jhawar, S.
Desmodium gangeticum, *DC.*; Leguminosæ.
Local,—Nakial.
Vern.—Taudi bhedi janitet, S.
Desmodium gyrans, *DC.*; Leguminosæ.
Vern.—Taben arak, S.
Desmodium gyroides, *DC.*; Leguminosæ.
Desmodium latifolium, *DC.*; Leguminosæ.
Vern.—Sim matha sura, S.
Desmodium parvifolium, *DC.*; Leguminosæ.
Vern.—Tandi chatom arak, tandi sun-suni, S.; Khet sun-suni, H.
Desmodium polycarpum, *DC.*; Leguminosæ.
Local,—Brahmini, Karanji, Karjani.
Vern.—Baiphool, S.
Desmodium pulchellum, *Benth.*; Leguminosæ.
Local,—Paikh.
Vern.—Bir Kapi, S.
Desmodium triflorum, *DC.*; Leguminosæ.
Local,—Amat chingar.
Dhaiphūl; Woodfordia floribunda, *Salisb*; Lythraceæ.
Local,—Dawai-dhawei phūl, dhowra, daho, jaiphul.
Vern.—Ichak, S.
Olim (Grislea tomentosa, *Roxb.*)
Dhamin; Grewia tiliæfolia, *Vahl.*; Tiliacæ.
Local—Damin.
Vern.—Olat, tarse Kotap, S.; Dhamin gaphni, K.
"The wood is much valued for banghy poles" Camp and Watt.

Dhaunta ; Anogeissus latifolia, *Wall.*; Var. glabra. Combretaceæ.
Olim (Conocarpus latifolia, *DC.*).
Dhawei, see Dhaiphul.
Dhela Kanta (1); Alangium Lamarckii, *Thw.*; Cornaceæ.
Vern.—Dela Kanta, S.
Dhela Kanta (2); Hygrophila spinosa, *T. Anders.*; Acanthaceæ.
Dhori băn ; Andropogon Gryllus, *Linn.*; Gramineæ.
Dhowra (1); see Dhaiphul.
Dhowra (2) ; Panicum colonum, *Linn.*; Gramineæ.
Local,—Bur'ndo ghans.
Vern.—Sama ghas, S.
Dhub ghans; Cyndaon dactylon, *Pers.*; Gramineæ.
Vern.—Dhobi ghas, S.; Dubghas, H.
Dicliptera Roxburghiana, *Nees.*; Acanthaceæ.
Digera arvensis, *Forsk.*; Amarantaeæ.
Vern.—Kari gandhari, S.
Dīla = Dela = Dhela Kanta (1) *q.v.*
Dillenia indica, *Linn.*; Dilleniaceæ
Vern.—Korkot, S.
Dillenia pentagyna, *Roxb.*; Dilleniaceæ.
Local.—Agōr, gūlgūl, Korkot.
Dimbu phūl ; Ocimum gratissimum, *Linn.*; Labiatæ.
Local,—Băn tulsi, Kāla tūlsi.
Dioscorea anguina, *Roxb.*; Dioscoreaceæ.
Dioscorea bulbifera, *Linn.*; Dioscoreaceæ.
Vern.—Bengo nari, S.
Local.—Ghenti ghenti kanda.
Dioscorea dæmona, *Roxb.*; Dioscoreaceæ.
Dioscorea glabra, *Roxb.*; Dioscoreaceæ.
Vern.—Ato-sang, S.
Dioscorea Hamiltoni, *Hook. f.*
Dioscorea oppositifolia, *Linn.*; Dioscoreaceæ.
Vern.—Piska, S.
Dioscorea pentaphylla, *Linn.*; Dioscoreaceæ.
Dioscorea sativa, *Linn.*; Dioscoreaceæ.
Dioscorea Wallichii, *Hook. f.*; Dioscoreaceæ.
Diospyros Embryopteris, *Pers.*; Ebenaceæ.
Vern.—Tiril, S., K.; Kend, H.; Makarkenda, S.
Diospyros melanoxylon, *Roxb.*; Ebenaceæ.
The Ebony tree.
Local,—Khend, tiril.

Diospyros montana, *Roxb.*; Ebenaceæ.
Indian Ebony.
Local,—Gara tiril.
Vern.—Gada terel, S.
Gara teril, *Mundari*; Chutia Nagpur.
Dodonæa viscosa, *Linn.*; Sapindaceæ.
Grown as a hedge.
Doka; Odina Wodier, *Roxb.*; Anacardiaceæ.
Vern.—Doka, S.; Jiyat, B.
Dolichos biflorus, *Linn.*; Leguminosæ.
Local,—Kurti.
Vern.—Horec, S.; Kurthi, H.
Dolichos Lablab, *Linn.*; Leguminosæ.
Vern.—Malhan, S.; Sim, H.
Dopatrium junceum, *Roxb.*; Scrophularineæ.
Dregea volubilis, *Benth.*; Asclepiadaceæ.
Vern.—Marang kongat, S.
Drosera Burmani, *Vahl.*; Droseraceæ.
Dudhi (1); Holarrhena antidysenterica, *Wall.*; Apocynaceæ.
Local,—Koreia, bara dudhi, băr ki dudhi.
Vern.—Hat, S., K., H.
Dudhi (2); Gouania microcarpa, *DC.*; Rhamneæ.
Local,—Pahar ka dudhi.
Dudhi băn; Cephalostigma Schimperi, *Hochst.*; Campanulaceæ.
Local,—Ban dudhi.
Dudri; Gardenia turgida, *Roxb.*; Bubiaceæ.
Local,—Kărkăr.
Vern.—Dundu kit, S.; Karhar, K.
Dududhia; Euphorbia pilulifera, *Linn.*; Euphorbiaceæ.
Vern.—Pusi toa, S., Dudhi, H.
Dūmăr; Ficus hispida, *Linn. f.*; Urticaceæ.
Local,—Porho.
Duranta Plumieri, *Jacq.*; Verbenaceæ.
Cultivated as a hedge. One variety has thorns, the other none; both have pretty blue heads of flowers and orange-yellow berries, size of *haws*.
Dysophylla cruciata, *Benth.*; Labiatæ.
Dysophylla verticillata, *Benth.*; Labiatæ.
Vern.—Pan singa baha, S.
Ebony,—Indian; Diospyros melanoxylon, *Roxb.*; Ebenaceæ.
Local,—Khend, Tiril.

Echinops echinatus, *Roxb.*; Compositæ.
Eclipta alba, *Hassk.*; Compositæ.
Vern.—Lal kesari, S.
Ehretia laevis, *Roxb.*; Borragineæ.
Vern.—Pusi pan, S. (1).
Pusi pan, S. (2) is Heliotropium strigosum, *Willd.*; Borragineæ.
Eksirha; Micromelum pubescens, *DC.*; Rutaceæ.
Elaeocarpus serratus, *Linn.*; Tiliaceæ.
Indian Olive; in Dorunda Garden.
Vern.—Julpi.
Hence, "*Julpai*-guri"—town; district.
Elaeodendron glaucum, *Pers.*; Celastrineæ.
Vern.—Neuri, S.; Thanki, K.
Eleocharis fistulosa, *Schultes.*; Cyperaceæ.
Elephantopus scaber, *Linn.*; Compositæ.
Loca,—Murghi chūndi, tal mūli.
Vern.—Manjur juti, S.
Peacock's slippers.
Eleusine ægyptiaca, *Desf.*; Gramineæ.
Vern.—Suntu bekuic, S.
Eleusine indica, *Gærtn.*; Gramineæ.
(coracana, *Gaertn.*); Gramineæ.
E. coracana, "is the cultivated form of *indica*." (*Fl. Br. Ind.*)
Local,—Mărūa.
Vern.—Kode, S.; Marua, H.; Murha, B.
It is widely and largely cultivated and used as a food-grain.
Elytrophorus articulatus, *Beam.*; Gramineæ.
Embelia robusta, *Roxb.*; Myrsineæ.
Local,—Sasapora, babirung.
Emilia sonchifolia, *DC.*; Compositæ.
Entada scandens, *Benth.*; Leguminosæ.
Equisetum debile, *Roxb.*; Equisetaceæ.
Local,—Nar jori.
Vern.—Buru katkom charec, S.
Eragrostis amabilis, *W. & A.*; Gramineæ.
Vern.—Ich koch, goda lukui, S.
Eragrostis bifaria, *W. & A.*; Gramineæ.
Eragrostis brachyophylla, *Stapf.*; Gramineæ.
Eragrostis ciliaris, *Link.*; Gramineæ.
Vern.—Tor chandbol, S.
Eragrostis ciliata, *Nees.*; Gramineæ.

Eragrostis coromandelina, *Trin.*; Gramineæ.
Eragrostis cynosuroides, *Beauv.*; Gramineæ.
Eragrostis elegantula, *Steud.*; Gramineæ.
Eragrostis interrupta, *Beauv.*; Gramineæ.
Eragrostis major, *Host.*; Gramineæ.
Eragrostis nardoides, *Trin.*; Gramineæ.
Eragrostis nigra, *Nees.*; Gramineæ.
Eragrostis pilosa, *Beauv.*; Gramineæ.
Eragrostis stenophylla, *Hochst.*; (E. Brownei, *Nees*). Gramineæ.
Local,—Burni.
Eragrostis tenella, *Roem & Sch.;* Gramineæ.
Vern.—Ich Koic, S.
Eragrostis tremula, *Hochst.;* Gramineæ.
Eriobotrya japonica, *Lindl.*; Rosaceæ.
The Loquat, E.
Fruit inconsiderable; cultivated Dorunda Garden.
Eriocaulon luzulæfolium, *Mart.*; Eriocauleæ.
Eriolaena Hookeriana, *W. & A.*; Sterculiaceæ.
Vern.—Bundum, oitbulung, pora, *K.*; Goaguli, S.
Local,—Denri, kuru, wawas, chota chungūr.
Eriolæna spectabilis, *Planch.*; Sterculiaceæ.
Local,—Bhawat, pardawan.
Eriosema chinense, *Vogel.*; Leguminosæ.
Vern.—Konden, S.
Eruca sativa, *Lamk.*; Cruciferæ.
Erycibe paniculata, *Roxb.*; Convolvulaceæ.
Local,—Huru bid, koel gumar.
Vern.—Kari, S.
Erythræa Roxburghii, *G. Don.*; Gentianaceæ.
Vern.—Gada sigrik, S.
Erythrina indica, *Roxb.*; Leguminosæ.
Vern.—Marar baha, S.
Eucalyptus globulus, *Labill.*; Myrtaceæ.
Cultivated on Tea Estates.
Eucharis amazonica; Amaryllideæ.
Cultivated in pots.
Euginia caryophyllata, *Willd.*; Myrtaceæ.
The Clove tree Eng.
Eugenia caryophyllifolia, *Lamk.*; Myrtaceæ.
Vern.—Bir Rod, S.; Jamun, K.
Eugenia Jambolana, *Lamk.*; Myrtaceæ.
Local,—Jam, Jamun.
Vern.—Chuduk bud, sokod, S.; Jamun, K., H.

Eugenia operculata, *Roxb.* ; Myrtaceæ.
Vern.—Totonopak, S.
Eugenia ? sp. ; Myrtaceæ.
Local,—Okar jam.
Okar jam, Chutia Nagpur, may be a Jamun : not identified.
Eulophia nuda, *Lindl.* ; Orchideæ.
Eulophia *sp.* ; Orchideæ.
Vern.—Bonga taini, S.
Euphorbia antiquorum, *Linn.* ; Euphorbiaceæ.
Euphorbia Bojeri, *Hook.* ; Euphorbiaceæ.
Adjutant's hedge. E.
Euphorbia dracunculoides, *Lamk.* ; Euphorbiaceæ.
Local,—Chota brahmini.
Vern.—Parwa jhara, S.
Euphorbia Chamaesyce, *Roxb.* Euphorbiaceæ.
Vern.—Dudhia phul, S.
Euphorbia granulata, *Forsk.* ; Euphorbiaceæ.
Vern.—Kanta arak, S.
Euphorbia hypericifolia, *Linn.*
Euphorbia microphylla, *Heyne.* ; Euphorbiaceæ.
Vern.—Dudhia phul, S.
Euphorbia pilulifera, *Linn. f.* ; Euphorbiaceæ.
Local,—Dududhia.
Vern.—Pusi toa, S. ; Dudhi, H.
Euphorbia prolifera *Ham.* ; Euphorbiaceæ.
Local,—Hurburia (3).
Euphorbia scabrifolia, Kurz. Euphorbiaceæ.
Vern.—Janhe hirom, S.
Euphorbia thymifola, *Burm.* ; Euphorbiaceæ.
Vern.—Chota dudhi, H. ; Nanha pusi toa, S. ; Swet-Kerua, B.
Evolvulus alsinoides, *Linn.* ; Convolvulaceæ.
Local,—Khusia.
Vern.—Tandi Khode baha.
Exacum petiolare, *Griesb.* ; Gentianaceæ.
Exacum tetragonum, *Roxb.* ; Gentianaceæ.
Feronia elephantum *Correa* ; Rutaceæ.
Vern.—Koch bel, S. ; Katbel, H.
Ficus bengalensis, *Linn.* ; Urticaceæ.
Vern.—Bare dare, S. ; Bar, H. Banyan, E.
Ficus Cunia, *Ham.* ; Urticaceæ.
Local.—Dūmbăr.
Vern.—Hor podo, S.

Ficus gibbosa, *Blume.*; Urticaceæ.
Ficus glomerata, *Roxb.*; Urticaceæ.
Local,—Gūlăr?
Vern.—Loa, S.
Ficus hispida, *Linn. f.*; Urticaceæ.
Local,—Dūmăr, porho.
Ficus indica, *Linn.*; Urticaceæ.
Local,—Būr.
Ficus religiosa, *Linn.*; Urticaceæ.
Local,—Pipul.
Vern.—Hesak, S.; Pipar, K.
Ficus retusa, *Linn.*; Urticaceæ.
Local,—Bour, buru hesa.
Ficus Roxburghii, *Wall.*; Urticaceæ.
Ficus scandens, *Roxb.*; Urticaceæ.
Vern.—Madhur lata, S.
Fimbristylis diphylla, *Vahl.*; Cyperaceæ.
Local,—Chunki, khaksi ban, sisu ban.
Fimbristylis ferruginea, *Vahl.*; Cyperaceæ.
Fimbristylis junciformis, *Kunth.*; Cyperaceæ.
Vern.—Bindi muthi, S.
Fimbristylis monostachya, *Hassk.*; Cyperaceæ.
Vern.—Nana bindi mutha, S.
Flacourtia Ramontchi, *L'Her. Var.*—2 sapida, *Roxb.*; Bixineæ.
Vern.—Merlec, S.
Flemingia Chapper, *Ham.*; Leguminosæ.
Flemingia congesta, *Roxb.*; Leguminosæ.
Vern.—Bir but, buru ekasira nari, S.
Flemingia stricta, *Roxb.*; Leguminosæ.
Flemingia strobilifera, *R. Br. Var.*—bracteata.; Leguminosæ.
Vern.—Sim busak, S.
Flueggia microcarpa, *Blume.*; Euphorbiaceæ.
Local,—Bakleri.
Gadsi; Limnophila conferta, *Benth.*; Scrophularineæ.
Galphuli; Cardiospermum Halicacabum, *Linn.*; Sapindaceæ.
Vern.—Putki malla, S.
Gānja; Cannabis sativa, *Linn.*; Urticaceæ.
Churrus, Bhăng and Hashish are made from it. Hemp, E.
Cultivated, common.
Gara Tiril; Diospyros montana, *Roxb.*; Ebenaceæ.
Vern.—Gada-terel, S.
Gardenia gummifera, *Linn.* Rubiaceæ.
Local,—Burui.

Gardenia latifolia, *Roxb.*; Rubiaceæ.
Local,—Papra, Karhar.
Vern.—Popro, S.; Papro, K.

Gardenia turgida, *Roxb.*; Rubiaceæ.
Local,—Dudri, Karkar.
Vern.—Dundu kit, S.; Karhar, K.

Gari sindri; Mallotus philippinensis, *Muell*; (Rottlera tinctoria, *Roxb.*) Euphorbiaceæ.
Only found once at Rampur near Palandu.
Local,—Rori.
Vern.—Rora, S.

Gărsūl; Carissa spinarum, *A. DC.*; Apocynaceæ.
Local,—Karanda, etc.
"A state of C. Carandas, Linn." *So Brandis.*

Garuga pinnata, *Roxb.*; Burseraceæ.
Local,—Băra ginjen, kenkar.

Geaster species; Fungi.
Local,—Rugura.

Gelonium multiflorum, *A. Juss.*; Euphorbiaceæ.

Geranium ocellatum, *Camb.*; Geraniaceæ.

Getia; Spermacoce stricta, *Linn. f.*; Rubiaceæ.

Ghanto; undetermined: Compound leaves 3½″ to 2″. Fig-shaped fruit, in sal jungle.

Ghenti Kanda; Dioscorea bulbifera, *Linn.*; Dioscoreaceæ.
Local,—Ghenti.
Vern.—Bengo nari, S.

Ghetia kena; Caesulia axillaris, *Roxb.*; Compositæ.

Ghetia phūl; Vernonia Roxburghii, *Less.*; Compositæ.

Ghora ghans; Andropogon montanus, *Roxb.*; Gramineæ.

Ginjen (1); Guizotia abyssinica, *Cass.*; Compositæ.
Local,—Sirguja, kala til, ram til. Black niger of commerce.

Ginjen (2), Stereospermum suaveolens, *DC.*; Bignoniaceæ. *q.v.*

Globba orixensis, *Roxb.*; Scitamineæ.
Vern.—Sarparating, S.

Glochidion Heyneanum, *Wight.*; Euphorbiaceæ.

Glochidion lanceolarium, *Dalz.*; Euphorbiaceæ.
Local,—Chikni.
Vern.—Bania Kandhum, S.

Gloriosa superba, *Linn.*; Liliaceæ.
Vern.—Siric samano, S.

Glossogyne pinnatifida, *DC.*; Compositæ.
Vern.—Barangom, bir-barangom, S.

Gloxinia *sp.*; Gesneraceæ.
Glycine Soja, *Sieb. & Zucc.*; Leguminosæ.
Vern.—Hinde disom horec. S.; Ram Kurthi, H.
The black variety. The white variety is *Pond* disom horec. S.
Gmelina arborea, *Linn.*; Verbenaceæ.
Local,—Gumar, gumhar.
Vern.—Kasmar, S.; Gumher, K.; Gamhar, H.
Gnaphalium indicum, *Linn.*; Compositæ. Flowers white.
Gokura; Barleria cristata, *Roxb.*; Acanthaceæ.
Gondli; Panicum proliferum, *Lam.*; Gramineæ.
Goot; Zizyphus xylopyrus, *Willd.*; Rhamneæ.
Vern.—Karkat, S.; Karkatta, K.
Gorunda; Combretum decandrum, *Roxb.* Combretaceæ.
Local,—Gurunda.
Gossypium arboreum L., Cam. and Watt. Cultivated in fields.
Gossypium herbaceum, *Linn*; Malvaceæ.
Cotton, E.
Local, Kapas; (cotton wool) Rui.
Vern.—Budhi kaskom, bhoga kaskom, S.; Bhoga kapas, budhia kapas, H.
Gouania leptostachya, *DC.*; Rhamneæ.
Gouania microcarpa, *DC.*; Rhamneæ.
Local,—Paharka dudhi.
Grewia asiatica, *Linn.*; Tiliaceæ.
Grewia laevigata, *Vahl.*; Tiliaceæ.
Grewia pilosa, *Lamk.*; Tiliaceæ.
Local,—Gur sikri.
Grewia polygama, *Roxb.*; Tiliaceæ.
Vern.—Seta andir, seta kata, S.; Kukur bicha, H.
Grewia salvifolia, *Heyne.*; Tiliaceæ.
Local,—Bitchra.
Grewia tiliæfolia, *Vahl.*; Tiliaceæ.
Local,—Bengadaru.
(Grewia vestita, *Wall.*); Tiliaceæ.
Vern.—Olat, S.
G. vestita, *Wall.*, is placed under G. asiatica, *Linn.*, in the Fl. Br. Ind., but Dr. Watt claims this to be a distinct species.
Vern—Kal, S.
Grewia villosa, *Willd.*; Tiliaceæ.
Vern.—Gaphni, Tarse kotap, S.; Gaphni, dhamin, K.

(Grislea tomentosa) *Roxb.* = Woodfordia floribunda, *Salisb.*; Lythraceæ.

Local,—Dhaiphūl, dhawai, dhowra, Jaiphūl, Ichac, S.

Many places bear the aboriginal native names of plants. Thus *Ichak* is a town three miles north of Hazaribagh, Tirila village three miles south-west of Doranda, Dumri, Hesel, Sarjom-dih, Kotanga, Sirguja State. Hindi names are Julpaiguri and Sal bari, Kasmar, Santali.

Guizotia abyssinica, *Cass.*; Compositæ.

Local,—Ginjen (or jitingi) sirguja, sirgujia, kala til, ramtil Black niger the seed.

Vern.—Surguja, S. H. K.

It is curious that the *plant* "Sirguja" is called "Ginjen" (or "Jitingi") and not "Sirguja" in Sirguja State (and in Jaspur State).

Olim G. oleifera DC. and Verbesina sativa, *Roxb.* An oil-seed. Oil as far as I know is not used in cooking.

Gulab, gulabaha. The rose.

Gulainchi; Plumeria acutifolia, *Poir, q.v.*; Apocynaceæ.

Local,—Chămka.

Often called *chămpa* in Chutia Nagpur; Michelia Champaca is champa.

Gulgul; Dillenia pentagyna, *Roxb.*; Dilleniaceæ.

Local,—Agor, Korkot.

Guma; Cleome viscosa, *Linn.*; Capparideæ.

Gungai; Panicum sp.; Gramineæ.

Gur; Saccharum officinarum, *Linn.* Gramineæ; Sugarcane.

Local,—Katari, ketari, ook.

Cult. "Gur," the crude native product, is questionably used for the plant.

Gūr gūr; Coix Lachryma Jobi, *Linn.*; Gramineæ.

Vern.—Jargadi.

Guria; Stephegyne parvifolia, *Korthal.*; Rubiaceæ.

Gurilerung; Ichnocarpus pubescens, *R. Br.*; Apocynaceæ.

Local,—Chota dudhi.

Gur Karanj, Ailanthus excelsa, *Roxb.*; Simarubeæ.

Gūr sikri; Grewia pilosa, *Lamk.* Tiliaceæ.

Gurunda=Gorunda, see above.

Gute băn; Olax scandens, *Roxb.*; Olacineæ.

Guti; Croton olongifolius, *Roxb.*; Euphorbiaceæ.

Local,—Putri.

Vern.—Poter, K.

Gynandropsis pentaphylla, *DC.*; Capparideæ.
Habenaria affinis, *Wight.*; Orchideæ.
Habenaria galeandra, *Benth.*; Orchideæ.
Habenaria goodyeroides, *Don.*; Orchideæ.
Habenaria Lawii, *Hook f.*; Orchideæ.
Habenaria marginata, *Coleb*; Orchideæ.
Habenaria platyphylla, *Spreng.*; Orchideæ.
Habenaria stenopetala, *Lindl.*; Orchideæ.
Habenaria Susannæ, *Br.*; Orchideæ.
Hamiltonia suaveolens, *Roxb.*; Rubiaceæ.
Hăldi; Curcuma longa, *Linn.*; Scitamineæ.
Turmeric, cultivated.
Hărhăria; Pulicaria angustifolia, *DC.*; Compositæ.
Local,—also pronounced Hŭrhŭria, *q.v.* (1), (2) and (3).
Hări tăki; Terminalia Chebula, *Retz.*; Combretaceæ.
Hăsua dŭhŭri; Leea aspera, *Wall.*; Ampelideœ.
Local,—Hensuadowri, akori.
Hedychium coccineum, *Ham.*; Scitamineæ.
Scarlet—on Baragai Hill and Marāngburu.
Hedychium coronarium, *Linn.*; Scitamineæ.
Local,—Saida.
Helicteres Isora, *Linn.*; Sterculiaceæ.
Vern.—Pechamra, S.
Collected in Dorunda garden; a shrub.
Heliotropium strigosum, *Willd.*; Bor agineæ.
Vern.—Pusi pan, S. (2).
Another Pusi pan, S. (1) is Ehretia levis, *Roxb.*; Borageneæ.
Hemidesmus indicus, *R. Br.*; Asclepiadaceæ.
Hemigraphis latebrosa, *Nees.*; Acanthaceæ.
Hensuadowri=Hasua duhuri, see above.
Heptapleurum venulosum, *Seem.*; Araliaceæ.
Herpestis Hamiltoniana, *Benth.*; Scrophularineæ.
Hesa; Ficus religiosa, *Linn.*; Urticaceæ
Local,—Pipăl, pípăr.
Vern.—Hesac, S.
Often parasitic or a climber upon ruins. Destroys palm and other trees.
Heylandia latebrosa, *DC.*; Leguminosæ.
Hibiscus cancellatus, *Roxb.*; Malvaceæ.
Local,—Bera kanda.
Vern.—Bir kaskom, S.

Hibiscus cannabinus, *Linn.*; Malvaceæ.
Vern.—Dare kudrum.
Hibiscus radiatus, *Willd.*; Malvaceæ.
Hibiscus Rosa-sinensis, *Linn.*; Malvaceæ.
Local,—Shoe flower.
Cultivated for its flowers,—said to blacken leathers, hence shoe flower.
Hibiscus Sabdariffa, *Linn.*; Malvaceæ.
Local,—Pătŭa. Arak kudrum. S.
Cultivated. Calyces made into jelly very like red-currant jelly.
Holarrhena antidysenterica, *Wall.*; Apocynaceæ.
The commonest shrub in the scrub jungles of Chutia Nagpur.
Local,—Dudhi, Koreia, kŭrchi, bara dudhi, bar ki dudhl.
Vern.—Hat, S., K., H.
No wood like this for *turning*. Toys even (*e.g.*, Dinapur Toys) are made of it, and *nests* of boxes.
Holmskioldia sanguinea, *Retz.*; Verbenaceæ.
Vern.—Jhimbiriya, S.
Holoptelea integrifolia, *Planch.*; Ulmus integrifolia *Roxb.* urticace.
Local,—Chiryta.
Holostemma Rheedii, *Wall.*; Apocynaceæ.
Vern.—Moron Arak.
Homonoia riparia, *Lour.*; Euphorbiaceæ.
Local,—Cheur.
Hoppea dichotoma, *Willd.*; Gentianaceæ.
Local,—Sikaie.
Hundibaha; Jasminum? pubescens, *Willd.*; Oleaceæ.
(J. hirsutum, *Willd.*)
Hurhuria (1); Pulicaria angustifolia, *DC.*; Compositæ.
Hurhuria (2); Scoparia dulcis, *Linn.*; Scrophularineæ.
Hurhuria (3); Euphorbia prolifera, *Ham.*; Euphorbiaceæ.
(E. Nepalensis, *Bois*).
Hurritaki, see Haritaki.
Huru bid; Ericybe paniculata, *Roxb.*; Convolvulaceæ.
Local,—Koel gumar.
Hydrilla verticillata, *Carp.*; Hydrocharideæ.
Hydrocotyle asiatica, *Roxb.*; Umbelliferæ.
Hygrophila spinosa, *T. Anders.*; Acanthaceæ.
Local—Dhela kanta (2), Gokula janum, S.
Hygrophila salicifolia, *Nees.*; Acanthaceæ.
Vern.— Mathom arak.

Hymenodictyon excelsum, *Wall.*; Rubiaceæ.
Local,—Burkund.
Vern.—Bhorkond, S.
Abundant in Tundi forests. (*Camp. & Watt*).
Hyptianthera stricta, *W & A.*; Rubiaceæ.
Hyptis suaveo'ens, *Poit.*; Labiatæ.
Vern.—Ganga tulsi, S.
Ichnocarpus frutescens, *R. Br.*; Apocynaceæ.
Local,—Gurilerung, chota dudhi.
Vern.—Dudhi lota, S.; dudhi, K.; dudhi lata, H.
Hysanthes hyssopoides, *Bth.*; Scrophularineæ.
Imperata arundinacea, *Cyrill.*; Gramineæ.
Indarjow; Pavetta indica, *Linn.*; Rubiaceæ.
Local,—Chirci gora, nunda.
Indigo; Indigofera tinctoria, *Linn.*; Leguminosæ.
Both plant and dye are called *Nil* or *Lil*, locally cultivated in fields. (Blue=Eng).
Indigofera linifolia, *Retz.*; Leguminosæ.
Vern.—Tandi khode baha, S.
Indigofera pulchella, *Roxb.*; Leguminosæ.
Local,—Jerool phūl.
Vern.—Dare huter, S.; Jhur hur, H.; lilibichi, S.
Indigofera tinctoria, *Linn.*; Leguminosæ.
Local,—Nil, Lil, Indigo, E.
Cultivated in fields.
Ionidum suffruticosum, *Ging.*; Violaceæ.
Vern.—Bir suraj mukhi; tandi sol, S.
Iphigenia indica, *Kunth.*; Liliaceæ.
Vern.—Chutia chandbol, S.
Ipomæa barlerioides, *Benth.*; Convolvulaceæ.
Ipomæa Batatas, *Lamk.*; Convolvulaceæ.
Local,—Sakarkand.
Vern.—Sakarkenda, S. and H. Common; cultivated.
Ipomæa Bona-nox, *Linn.*; Convolvulaceæ.
Moon flower, E.
Ipomæa cymosa, *R. & S.*; Convolvulaceæ.
Ipomæa eriocarpa, *R. Br.*; Convolvulaceæ.
Local,—Kijuli.
Ipomæa hederacea, *Jacq.*; Convolvulaceæ.
Ipomæa muricata, *Jacq*; Convolvulaceæ.
Ipomæa obscura, *Ker.*; Convolvulaceæ.
Ipomæa pes-tigridis, *Linn.*; Convolvulaceæ.

Ipomæa purpurea, *Lamk.*; Convolvulaceæ.
Ipomæa Quamoclit, *Linn.*; Convolvulaceæ.
Ipomæa quinata, Br.; Convolvulaceæ.
Ipomæa semperflorens, Convolvulaceæ.
Ipomæa sepiaria, *Kœnig.*; Convolvulaceæ.
Ipomæa sessiliflora, *Chois.*; Convolvulaceæ.
Ipomæa speciosa, *R. & S.*; Convolvulaceæ.
Vern.—Karmbi arak, S.
Ipomæa tridentata, *Roth.*; Convolvulaceæ.
Ipomæa turpethum, *Br.*; Convolvulaceæ.
Vern.—Bana etka, S.
Ipomæa vitifolia, *Sweet.*; Convolvulaceæ.
Isachne australis, *Br.*; Gramineæ.
Isachne miliacea, *Roth.*; Gramineæ.
Isachne sp.; Gramineæ.
Ischæmum angustifolium, *Hack.*; Gramineæ.
Ischæmum aristatum, *Linn.*; Gramineæ.
Ischæmum ciliare, *Retz*; Var.—*a.* genuina *Hack* Gramineæ.
Ischæmum hirtum, *Hack.*; Gramineæ.
Ischæmum rugosum, *Salisb.*; Gramineæ.
Iseilema Wightii, *Anders.*; Gramineæ.
(Isolepis supina, *Br.*) = Scirpus supinus, *Linn.*; Cyperaceæ.
Iurutia; Cleome viscosa, *Linn.*; Capparideæ.
Ixora parviflora, *Vahl.*; Rubiaceæ.
Vern.—Merom met, S., Loha jangia, H.
Ixora *sp.* Rubiaceæ. Cultivated in gardens.
Jaiphūl; Woodfordia floribunda, *Salisb.*; Lythraceæ.
Local.—Dhæphūl, which see.
Jalkari; Chara fœtida *A. Br.*; Characeæ.
Jalkumi; Ottelia alismoides, *Pers.*; Hydrocharideæ.
Jāmūn; Eugenia Jambolana, *Lamk.*; Myrtaceæ.
Local.—Kuda, Jam.
Vern.—Chuduk bud, so Rod, S.; jamun, K. H.
Jāmūn bili; Zizyphus Jujuba, *Lamk.*; Rhamneæ.
Local.—Bær.
Vern.—Jamun bili, K.
Jāmūn daru; Zizyphus rugosa, *Lamk.*; Rhamneæ.
Local.—Ghoot.
Vern.—Jamun daru, K.
Jar ka bariari; Ærua lanata, *Juss.*; Amarantaceæ.
Jasminum arborescens, *Roxb.*; Oleaceæ.
Vern.—Gada hund baha, S.

Jasminum pubescens, *Willd.*; Oleaceæ.
Local,—Jungli chameili.
Jatropha Curcas, *Linn.*; Euphorbiaceae.
Local,—Beranda.
Vern.—Baghbarinda, B.;
Local and Vern.—Bherenda S. and H.
Jatropha gossypifolia, *Linn.*; Euphorbiaceæ.
A roadside weed; common.
Jerul; Indigofera pulchella, *Roxb.*; Leguminosæ.
Local,—Jerul phūl.
Jharo (1); Justicia simplex, *D. Don.*; Acanthaceæ.
Jharo (2); Porana paniculata, *Roxb.*; Convolvulaceæ.
Silver creeper, Eng.
Vern.—Panjot nari, S.
Jinjūnia; Crotalaria prostrata, *Roxb.*; Leguminosæ.
Vern.—Katic jhunka, nanha jhunka, S.
"*Marang* jhunkays = C. alata *Ham.* (? Marung=large); hence Marang Baru." Baragai. The big hill N. of Ranchi.
Jow; Tamarix ericoides, *Rottl.*; Tamariscineæ.
Jungli Chameili; Jasminum pubescens, *Willd.*; Oleaceæ.
Jungli Piaj; ? ban piaj; Curculigo latifolia; *Dryand.*
Jussiæa suffruticosa, *Linn.*; Onagraceæ.
Vern.—Petra da, dak ichak, S.
Justicia (Adhatoda, *Linn.*)=Adhatoda vasica, *Nees.*; Acanthaceæ.
Justicia Betonica, *Linn.*; Acanthaceæ.
Vern.—Tayar baha, S.
Justicia diffusa, *Willd.*; Acanthaceæ.
Justicia procumbens, *Nees.*; Acanthaceæ.
Justicia quinqueangularis, *Koen.*; J. (peploides *Nees.*) Acanthaceæ.
Justicia simplex, *D. Don.*; Acanthaceæ.
Jute (1) Corchorus capsularis, *Linn.*; Tiliaceæ. Jute, Eng. and H.; Pāt, B.
Jute (2); Corchorus olitorius, *Roxb.*; Tiliaceæ.
Vern.—Bunpāt, Pāt B.; Jews' Mallow, E.
Jute (3) Crotalaria, juncea, *Linn.*; Leguminosæ.
Local.—Sūnpāt.
Vern.—Sūn, B. Cultivated for fibre.
Kachnal, Kāchnar; Bauhinia purpurea, *Linn.*; and other species; Leguminosæ.
Kadām; Anthocephalus Cedamba, *Miq.*; Rubiaceæ.
Olim (Nauclea Cadamba, *Roxb.*)

Kadir gach ; Acacia Catuch, *Willd.* ; Leguminosæ.
See Kut and Acacia Catechu.

Kajuli ; Saccharum officinarum, *Linn.* ; Gramineæ.
Sugarcane, Eng.
Local,—Katari, Ketari, gūr.
Vern.—Ak, Ik, Ook, Kooshiar, Pūri, Kălūa, Kajuli, B ; *Roxb.* Gunna, H.

Kakar ; Knoxia corymbosa, *Willd.* Rubiaceæ.
Local,—Banjira.

Kala tulsi ; Ocimum gratissimum, *Linn.* ; Labiatæ.

Kamala ; Mallotus philippinensis, *Muell.* ; (Rottlera tinctoria, *Roxb.*) Euphorbiaceæ.
Local,—Rori.
Vern.—Rora, S.

Kambraj ; Buettneria herbacea, *Roxb.* ; Sterculiaceæ.
Vern.—Diku sindur, S. Kambraj, H.

Kămrănga ; Averrhoa ; Carambola,—Geraniaceæ.

Kandri ; Chlorophytum *sp.* ; Liliaceæ.

Kapas ; Gossypium herbaceum, *Linn.* ; Malvaceæ.
Cotton, cotton wool, Eng.
Local,—Rui.
Vern.—Kaskom. Budhi kaskom, bhoga kaskom, S.

Kapur Kadam ; Leucæna glauca, *Bth.* ; Leguminosæ.

Karam ; Adina cordifolia, *Hk. f. e. Benth.* ; Rubiaceæ.
Olim (Nauclea cordifolia *Roxb.*)

Karani ; Desmodium polycarpum, *DC.* ; Leguminosæ.
Local,—Brahmani, karanji, karjani (1). Bæphol, S.

Karanj ; Pongamia glabra, *Vent.* ; Leguminosæ.
Vern.—Kuruinj, S.
A popular but smoky burning-oil for lamps is got from the seeds.

Karanji ; see Karani.

Karhar ; Gardenia latifolia, *Ait.* ; Rubiaceæ.
Local,—Papra.
Vern.—Popro, S. ; Papro, K.

Karhi, Kari ; Bridelia retusa, *Spreng.* ; Euphorbiaceæ.
Local,—Dorkeri, Kasai.
Vern.—Kasei, Rawj, Khaja H. ; Karika, *Bhumij*, B ; Karki Kadrupala, S. ; Kharaka, Kaka, K.

Karjani (1) ; see Karani.

Karjani (2) ; Abrus precatorius, *Linn.* ; Leguminosæ.
Vern.—Arak kawet, pond kawet, S. ; Rati, H., the seeds.

Karka ; see Kari, Karhi ; Bridelia retusa, *Spreng.*; Euphorbiaceæ.
Karmi; Stephegyne parvifolia, *Korth.*; Rubiaceæ.
Local, —Guria.
Vern.—Gore. S.
Olim (Nauclea parvifolia, *Roxb.*)
Kasai, see Karhi; Bridelia retusa, *Spreng.*; Euphorbiaceæ.
Kasei, see Karhi; Bridelia retusa, *Spreng.*; Euphorbiaceæ.
Kăsāri dall; Lathyrus sativus, *Linn*,; Leguminosæ.
Local,—Kesari.
A very pleasant *dall*, the too frequent use of which is said to produce dry gangrene. We have never seen or heard good evidence of this.
Kăt ; see Kut.
Kătai. (1) ; Flacourtia Ramontchi, *L'Herit.*; *Var.* sapida, *Roxb.* Bixineæ.
Vern.—Merlec, S.
Kătai (2) Randia uliginosa, *DC.*; Rubiaceæ.
Vern.—Pinde, S.; Pindar, K.
Katanga ; Cedrela Toona, *Roxb.*; Meliaceæ.
Local,—Toon, tūni.
Katari; Saccharum officinarum, *Linn.*; Gramineæ.
Sugarcane, E.
Local,— Ketari, Kosiar, gūr.
Vern.—Ook, *Sans.* ganna, H., etc.
Kat kalija, Kat karanja ; Cæsalpinia Bonducella, *Flem.*; Leguminosæ.
Kawa kanda ; Curculigo latifolia, *Dryand.*; Amaryllideæ.
Kawar tāmăr ; Mukia scabrella, *Arn.*; Cucurbitaceæ.
Kawj, see Karhi ; Bridelia retusa, *Spreng.*; Euphorbiaceæ.
Kejuli : Muckuna pruriens, *DC.*; Leguminosæ.
Cowhage, E.
Local,—Kijuli.
Vern.—Etka, S.; Alkusi, K. H.
"Kejuli," the itch ; name of *effect* given to *cause*.
Kela ; Banana, Plantain, E.; Musa sapientum, *Linn* , Scitamineæ.
Cultivated in gardens and orchards. Wild on Parasnath hill, S. side.
Kena ; Commelina benghalensis, *Linn.*; Commelinaceæ.
Kend ; Diospyros Melanoxylon, *Roxb.*; Ebenaceæ.
Indian ebony, E.
Local,—Khend, Tiril.
Vern.—Terel, S.; Kend, H.

Kenkur ; Garuga pinnata, *Roxb.* ; Burseraceæ.
Ketari, see Katari. Sugarcane, Eng.
Khair ; Acacia Catechu, *Willd.* ; Leguminosæ.
Local,—Kadir gach, kăt, kătch, kher.
Vern.—Khaiyar, S. · Khair, H.
Khaksi băn ; Fimbristylis diphylla *Vahl.* ; Cyperaceæ.
Local,—Chunki, Sisu băn.
Khardara ; Acacia pennata *Willd.* ; Leguminosæ.
Khend, see Kend ; Indian Ebony, E.
Kher ; see Khar ;
Kher ghans ; Andropogon ? Schœnanthus ; Gramineæ.
? Băra Kheir.
Khet gulab ; Ammannia pentandra, *Roxb.* ; Lythraceæ.
Khet kodo ; Eragrostis unioloides, *Nees.* ; Gramineæ.
Khet papra ; Oldenlandia corymbosa, *Linn.* ; Rubiaceæ.
Khusia ; Evolvulus alsinoides, *Linn.* ; Convolvulaceæ.
Kijuli (1) ; Mucuna pruriens, *DC.* ; Leguminosæ.
Cowhage, E.
Local,—Kejuli.
Causes intense itching ; *Oil gives immediate relief* by floating out the needles.
Kijuli (2) ; Ipomæa eriocarpa, *Br.* ; Convolvulaceæ.
Kijuli (3) ; Smithia sensitiva, *Ait.* ; Leguminosæ.
Knoxia corymbosa, *Willd.* ; Rubiaceæ.
Local,— Kakar, banjira.
Kodo ; Paspalum scrobiculatum, *Linn.* ; Gramineæ.
Vern.—Janhe, S., Kodo, H.
Koel gumar ; Ericybe paniculata, *Roxb.* ; Convolvulaceæ.
Local,—Huru bid.
Koreia ; Holarrhena antidysenterica, *Wall.*, Apocynaceæ.
Local,—Dudhi (1), Kurchi bara dudhi, băr ki dudhi.
Vern.—Hat, S., K., H.
Korkot ; Dillenia pentagyna, *Roxb.* ; Dilleniaceæ.
Local,—Agar, gūl gūl.
Korkota ; Vitis *sp.* ; Ampelideæ.
Kosiar, see Katari. Sugarcane.
Local,—Ketari, Gūr, Gănna, H. ; Ook, B., etc.
Kūchnar ; Bauhinia retusa, *Ham.* and other species ; Leguminosæ.
Local,—Kutchnar ; kuinar, etc.
Kuchli ; Vernonia cinerea, *Less.* ; Compositæ.
Local,—Kūnchli.

Kūda; Eugenia Jambolana, *Lamk.*; Myrtaceæ.
Local,—Jam, jāmūn.
Vern.—Chuduk bud, sokod, S. Jāmūn, H.

Kūdi phūl; Wendlandia exserta, *DC.*; Rubiaceæ.
Vern.—Hundro, pichari baha, S.

Kūdrūm; Hibiscus radiatus, *Willd*; Malvaceæ.

Kūinar; see Kuchnar and Bauhinia retusa, *Roxb*; Leguminosæ, also B. purpurea, *Linn.*; and B. variegata, *Linn.*

Kūi phūl; Butomopsis lanceolata, *Kunth.*; Alismaceæ,
This use of *Kui "phūl"* is specific, I know no other plant called by this name.

Kujeri; Celastrus paniculata, *Willd.*; Celastrineæ.
Local,—Kujili.
Vern.—Kujri, S. and H.

Kukri; A fungus; Fungi.

Kul kudari; Thespesia Lampas, *Dalz. & Gibs.*; Malvaceæ.
Local,—Băn kapas.

Kumhi; undetermined.
A tree; leaves crenate, 17 inches long.

Kūnchli, see Kuchli.

Kūndri; Zehneria umbellata, *Thw*; Cucurbitaceæ
Local,—Băn kūndri (2).

Kūrchi; Holarrhena, antidysenterica, *Wall.*; Apocynaceæ.
Local,—Dudhi, koreia, etc.
Vern.—Hat, S., K., H.

Kūsūm (1); Carthamus tinctorius, *Linn.*; Compositæ.
Safflower, Eng.
A dye plant. Cultivated.

Kūsūm (2); Schleichera trijuga, *Willd*; Sapindaceæ.
Vern.—Baru, S., Kusum H.
The lac insect is cultivated on the twigs of this tree in Chutia Nagpur.

Kūt; Acacia Catechu, *Willd*; Leguminosæ.
Local,—Kadri gach, kutch, kat, khair, kher-khair, H. Khaiyar, S.

Kutchnar, see Kuchnar & Bauhinia *sp.*; Leguminosæ.

Kutna; Solanum indicum, *Linn.*; Solanaceæ.

Kydia calycina, *Roxb.*; Malvaceæ.
Local,—Bitchra.
Vern.—Poska olat, S.; Pata dhamin, K.

Kyllinga monocephala, *Rottb.*; Cyperaceæ.

Lagenaria vulgaris, *Ser.*; Cucurbitaceæ. Cultivated.
Local, and Vern.—Kădu, S.

Lagerstrœmia parviflora, *Roxb.*; Lythraceæ.
Local,—Sidh.
Vern.—Sekrec, S.; Sidha, H.
I have not seen L. Flos-Reginæ, *Retz*, in Chutia Nagpur.

Lagerstrœmia indica, *Linn.*; Lythraceæ.
Cultivated for its pink, purple and white flowers. A common garden shrub.

Laggera flava, *DC.*; Compositæ.
Local,—Băn sirsu.
Vern.—Bir sirguja,S.

Lal Merich; Capsicum frutescens, *Linn.*; Solanaceæ.
Chilli, Capsicum, E. See also Mircha; Capsicum minimum.

Lala jan; Peristrophe bicalyculata, *Ness*; Acanthaceæ.

Lantana crenulata, *Otto & Dieter.*; Verbenaceæ.

Lasia heterophylla *Schott.*; Aroideæ.
Vern.—Kanta saru, S.

Lathyrus Aphaca, *Linn.*; Leguminosæ.
Local,—Chăna, Masur.
Vern.—Musoor, chŭna, bura chuna, B.

Lathyrus sativus, *Linn.*; Leguminosæ.
Local,—Kăsari, Kesari-dall, *q v.*

Launæa aspleniifolia, *Hk. f.*; Compositæ.
Vern.—Birmalla, S.

Lawangia; Sonerila tenera, *Royle.*; Melastomaceæ.

Lawsonia alba, *Lamk.*; Lythraceæ.
Henna, E.
Local,—Mehndi.
Vern.—Mihndi, S. and H.

Leea aspera, *Wall.*; Ampelideæ.
Local,—Hasua duhuri, Akori, Hensuadowri.
A *sag* common in jungle; root sweet-scented.

Leea macrophylla, *Roxb.*; Ampelideæ.
Vern.—Hatkan, S.
"A rare plant, like L. robusta; flrs. and flr.-stalk bright red."

Leea sambucina, *Willd. Var.* sanguinea, *Wall.*; Ampelideæ.

Leersia hexandra, *Sw.*; Gramineæ.

Leonotis nepetæfolia, *Br.* (Phlomis n., *Linn.*); Labiatæ.
Vern.—Dare dhompo. janum dhompo.

Lepidagathis hyalina, *Ness*; Acanthaceæ.

Lepidagathis scariosa, *Nees*; Acanthaceæ.
Vern.—Kulai lutur, S.
Leptodesmia congesta, *Benth.*; Leguminoseæ.
Local,—Sunia.
Leringi ghaṇs; Andropogon montanus. *Roxb.*; Gramineæ.
Local,—Ghora ghaṇs.
Lettsomia bella, *Clarke*; Convolvulaceæ.
Local,—Chitti.
Lettsomia setosa, *Roxb.*; Convolvulaceæ.
Local,—Băktchi phul.
Leucæna glauca, *Benth.*; Leguminosæ.
Local,—Kăpūr kădam.
Leucas aspera, *Spreng.*; Labiatæ.
Leucas Cephalotes, *Spreng.*; Labiatæ.
Vern.—Andia dhurup arak. S.; Dhurpi sag, H.
Leucas Clarkei, *Hk. f.*; Labiatæ.
Vern.—Enga dhurup arak, S.; Dhurpi sag, H.

NOTE.—*Enga* means female, in Mundari, thus :—	*Sandi Sadom*, a horse *Enga Sadom*, a mare	*S sern*, a cock *Enga sern*, a hen.

Leucas lanata, *Benth.*; Labiatæ.
Leucas mollissima, *Wall.*; Labiatæ.
Vern.—Gitil arak, S.
Leucas montana, *Spreng.*; Labiatæ.
„ mutans, *Spreng.*; Labiatæ.
„ pilosa, *Benth.*; Labiatæ.
„ urticæfolia, *R. Br.*; Labiatæ.
Lil; Indigofera tinctoria, *Linn.*; Leguminosæ.
Indigo, E.
Local,—Nīl.
Lil or Nīl (blue), both the dye and the plant.
Lila jan; Rungia parviflora, *Nees.*; Acanthaceæ.
Lilibaha; Ardisia humilis, *Vahl.*; Myrsineæ.
Local,—Mormori.
Limnanthemum cristatum, *Griesb.*; Gentianaceæ.
Limnanthemum indicum, *Griesb.*; Gentianaceæ.
Limnophila conferta, *Benth.*; Scrophularineæ.
Local,—Gadsi.
Limnophila gratioloides, *Br.*; Scrophularineæ.
Limnophila racemosa, *Benth.*; Scrophularineæ.
Vern.—Choto lutur, S.
Limnophila sessiliflora, *Bl.*; Scrophularineæ.

Lindenbergia urticæfolia, *Lehm.*; Scrophularineæ.
Linei; Eleocharis fistulosa, *Schult.* (*olim* Heliocharis); Cyperaceæ
Linum usitatissimum, *Linn.*; Lineæ.
Vern.—Tisi, B.
Linum sp.; Lineæ.
Several species of Linum cult. in gardens; Flowers crimson or white.
Lipocarpha sphacelata, *Kunth.*; Cyperaceæ.
Litsæa nitida, *Roxb.*; Laurineæ.
Litsæa sebifera, *Pers.*; Laurineæ.
Litsea; see Litsæa.
Lobelia trigona, *Roxb.*; Campanulaceæ.
Vern.—Chauric arak, S.
Lod; Ficus hispida, *Linn. f.*; Urticaceæ.
Local,—Dūmar, Porbo.
Lodh; Symplocos racemosa, *Roxb.*; Styraceæ.
Local,—Son pokri. tarop.
Vern.—Lodam, S.
Loranthus longiflorus, *Blume* (L. buddleioides, *Desr.*); Loranthaceæ.
Local and Vern.—Banda, S., H.
Loranthus Scurrula, *Linn.*; Loranthaceæ.
Vern.—Ichak banda, S.
Lūbān; Boswellia serrata, *Roxb.*; Butseraceæ.
Local,—Sally, salei.
The Gum, Luban. Olibanum, E.
Ludia băn; Pennisetum cenchroides, *Rich.*; Cyperaceæ.
Lud ludi băn; Aristida capillacea, *Lamk.*; Cyperaceæ.
Ludwigia parviflora, *Roxb.*; Lythraceæ.
Luffa acutangula; *Roxb.*; Cucurbitaceæ.
Lungora; Reinwardtia trigyna, *Dumort.*; Lineæ.
Vern.—Paror jhugia, S. ("Paror jhinga" in Santali index). Cultivated.
Lygodium scandens, *Sw.*; Filices.
Mădár; Calotropis gigantea, *Br.*; Asclepiadeæ.
Local,—Madar, phalti.
Vern.—Akauna, S.
Mæsa indica, *Wall.*; Myrsineæ.
Mahadeo jat; Uraria lagopoides, *DC.*; Leguminosæ.
Vern.—Lopong herak, toyo chandbol, S.

Mahua; Bassia latifolia, *Willd.*; Sapotaceæ.
Local,—Mowa, mădu kam.
Vern.—Matkom, S.; mandukum, K.; mahua, H.; mahul, B. The seed, Kuindi, S.; Kuchra, H. The oil, Kuinde sunum, S.; Kuchra ka tel, H.

Makar kend; Diospyros Embryopteris, *Pers.*; Ebenaceæ.
Local, Vern.—Tiril, S. K.; Kend, H.

Mak chūn; Pterospermum acerifolium, *Willd.*; Sterculiaceæ.
Vern.—Mach kunda, S.

Makur jalee; Paspalum sanguinale, *Lamk.*; Gramineæ.

Mallotus philippinensis, *Muell.*; (olim Rottlera tinctoria, *Roxb.*) Euphorbiaceæ.
Local,—Kamala, rori.
Vern.—Rora, S.

Mal maria; Eleusine indica, *Gærtn.*; *Var.* Coracana, *Gærtn.* Gramineæ.
Local,—Mărūa.
Vern.—Kode, S.; Marua. H.; Murha B.
Used as a food grain, largely. Marua Beer made from the grain, Darjeeling, etc.

Mángăr leta; Polygonum barbatum, *Linn.*; Polygonaceæ.
Vern.—Rani phul, S.

Mangifera indica, *Linn.*; Anacardiaceæ.
Local,—Am, awm, ool.
Vern.—Ul, S.
The Mango, E.

Mānj; Polygonum glabrum, *Willd.*; Polygonaceæ.
Local,—Machi or Machli ka mānj. A fish poison.

Mănjit, see Mŭnjīt.

Mărcheia; Pimpinella elata, *Dolz.*, Umbelliferæ.

Margosa; Melia Azadirachta, *Linn. q.v.*

Marsilea quadrifolia, *Linn.*; Marsileaceæ.
Local,—Sūn sūnia.
Vern.—Chatom arak, S. Sooni shunnaka, B. "*Beng.*—Shushni shak, who eat the leaves in their curries," *Roxb.*, Clarke's Ed. p. 745.

Martynia diandra, *Gloxine.*; Pedalineæ.
Devil's claw, E.
Vern.—Baglucha, S.
Not native: an American plant.

Marua, see Mal maria. Eleusine indica, *Gærtn.* *Var.* Coracana, *Gærtn.*; Gramineæ.

Masturia; Cassia mimosoides, *Linn.*; Liguminosæ.

Măsūr dall; Lathyrus Aphaca, *Linn.*; Leguminosæ.

Local,—Chăna.

Vern.—Chuna, bura chuna, B.

Masuria; Utricularia bifida, *Linn.*; Lentibulariaceæ.

Masuria; Utricularia racemosa, *Wall.* *Var.* filicaulis, Lentibulariaceæ.

Flowers of racemosa purple; of bifida yellow.

Mătăr, mutter; Pisum sativum, *Linn.*; Leguminosæ.

Cult. in gardens.

Mătăr, mutter; Pisum arvense, *Linn.*; Leguminosæ.

Cult. in fields.

Matha; Antidesma Bunius, *Spreng.*; Euphoriaceæ.

Mazus rugosus; *Lamk.*; Scrophularineæ.

Mehndi; Lawsonia alba, *Linn.*; Lythraceæ.

Henna, Eng.

Vern.—Mihndi S., H.

Melastoma malabathricum, *Linn.*; Melastomaceæ.

Indian rhododendron, Eng. (of C.B.C.)

Melia Azedarach, *Linn.*; Meliaceæ.

Peruvian or Persian lilac or Bastard Cedar, Eng.—Campbell and Watt.

Local,—Bakain, Belati bakain.

Vern.—Bokom baha, S.

Planted, common about stations.

Melia Azadirachta, *Linn.*; Meliaceæ.

Local,—Nim.

Vern.—Nim. S., K., H.;

Margosa Tree, Eng.

Melochia corchorifolia, *Linn.*; Sterculiaceæ.

Vern.—Thinak arak, S.

Menda; Pavetta indica, *Linn.*; *Var.* tomentosa. Rubiaceæ;

Vern.—Budhi tilai, hudhi ghasit, S.

Local,—Cherei gora, Indărjow.

Methi; Trigonella Fœnum- græcum, *Linn.*; Leguminosæ.

Used as a hair wash, the whole young plant.

Michelia Champaca, *Linn.*; Anonaceæ.

Cultivated. Another Chămpa is Plumeria which is properly Gulainchi; local.

Local and H.—Chămpa.

Micromelum pubescens, *Blume.*; Rutaceæ.
Local,—Ek sirha.

Micromeria biflora, *Benth.*; Labiatæ.

Miliusa velutina, *Hk. f. & T.*; Anonaceæ.
Vern.—Kome, Ome, S; Lal kari, K; Kari, H.

Millettia auriculata, *Baker*; Leguminosæ.
Local,—Ban simar.
Vern.—Hehel, S.

Mimosa pudica, *Linn.*; Leguminosæ.
Sensitive plant, Eng.

Mimosa rubicaulis, *Lamk.*; Leguminosæ.
Vern.—Sega janum, S.

Mimosa? sp. Leguminosæ.
Vern.—Siuri, jasmin.
Seed alone coll. Stem very prickly; fl. said to be white.

Mirabilis Jalapa, *Linn.* Marvel of Peru. E.; Nycatgineæ.
Cult. in gardens; common.

Mircha; Capsicum minimum, *Roxb.*; Solanaceæ.
Chilli, Eng.
Local,—Lal Měritch.
Birds'-eye Chilli, Cayenne pepper.

Miriri; Panicum antidotale, *Retz.*; Gramineæ.
Local,—Bēndē, bērē.
Vern.—Layo gundli, S.

Mistletoe; Viscum, *q.v.*

Mitreola oldenlandioides, *Wall.*; Loganiaceæ.

Mollugo, stricta, *Linn.*; Ficoideæ.

Momordica Charantia, *Linn.*; Cucurbitaceæ.
Vern.—Korilla, B.

Momordica dioica, *Roxb.*; Cucurbitaceæ.
Vern.—Kanchan arak (leaf), Karla (fruit), S.

Monochoria hastæfolia *Presl.*; Pontederiaceæ.

Monochoria vaginalis, *Presl.*; *Var.* plantaginea, *Kunth.*; Pontederiaceæ.
Vern.—Seta pan, S.

Morinda tinctoria *Roxb.*; Rubiaceæ.
Vern.—Chaili, S.

Moringa pterygosperma, *Gaertn.*; Moringeæ.
Vern.—Munga arak, S.
Horse-radish tree, Eng.

Mormori; Ardisia humilis, *Vahl. Var.* arborescens, *Wall.* Myrsineæ.

Local,—Lilibaha.

Morus atropurpurea, *Roxb.*; Urticaceæ.

Local,—Toont.

Mulberry, Eng.

Morus Indica, *Linn.*; Urticaceæ.

Local,—Toont.

Mulberry, E.

Morus laevigata, *Wall.*; Urticaceæ.

Local,—Toont.

Mulberry, Eng.

Mota gūndli; Panicum *sp.*; Gramineæ.

A food grain.

Motha ghaṇs: Kylinga *sp.*; Cyperaceæ.

Mowna; Randia dumetorum, *Lamk.*; Rubiaceæ.

Mozini; not determined.

Mucuna pruriens, *DC.*; Leguminosæ.

Cowitch, Cowhage, E.

Local,—Kejuli.

Vern.—Etka, S; Alkusi, K, H.

Mukia scabrella, *Arn.*; Cucurbitaceæ.

Local,—Kawa tamar.

Mŭkŭr khend; Diospyros Embryopteris, *Pers.*; Ebenaceæ.

Vern.—Kend, H; Tiril, S, K.

"Local,—khend" is D. melanoxylon.

Mūng dall; Phaseolus Mungo, *Linn.*; Leguminosæ.

Local,—Urid.

Vern.—Mung, Birsang, Ramra, S; Urid, H.

Cultivated largely in fields as a pulse-food for beast and man in India.

Mūnj (Local,—Saccharum arundinaceum), *Retz.*; Gramineæ.

Vern.—Sar ghas, L.

Local.—Endo.

The Korwas make their arrow shaft of the stems of this plant.

Mūnjit; Rubia tinctorum, *Linn.*; Rubiaceœ.

Madder, E.

Mūrghi chūndi; Elephantopus scaber, *Linn.*; Compositæ.

Local,—Tal muli.

Vern.—Manjur juti, S.

Mūrūt; Butea frondosa, *Roxb.* Leguminosæ.
Local,—Palas, paras.
Vern.—Murup, dare murup, S.; Dhak, B.

Musa sapientum, *Linn.*; Scitamineæ.
Banana, Plantain, E.
Local,—Kela.
Musa wild on Parasnath, S. side. Also cult. passim.

Mussaenda macrophylla, Rubiaceæ. Mussænda.
A commonly cultivated climber. (White bracts.)

Mutter, Mătăr; Pisum sativum, *Linn.;* Leguminosæ.
Field pea, Eng.
Vern.—Chota mutur, H. & B.
Cultivated in fields as a pulse.

Mutter sag; Antidesma, diandrum, *Roth.*; Euphorbiaceæ.

Nagarmota! Cyperus exaltatus, *Retz.* (C. alopecuroides, *Roxb.*
Cyperaccæ.

Nakial; Desmodium gangeticum, *DC.*; Leguminosæ.
Local,—Nakiel.

Nar jori; Equisetum debile, *Roxb.*; Equisetaceæ.

Nelsonia campestris *Br. Var.* vestita.; Acanthaceæ.

Nephelium Lit-chi, *Camb.;* Sapindaceæ. The Litchi of commerce.
Local—Litchi.
Litchi trees yield much fruit and good in Ranchi and Dorunda.

Nephrodium Filix-mas, *Rich. Var. d.* cochleatum, *Don,*; Filices.

Nephrodium truncatum, *Presl.*; Filices.

Nephrodium unitum, *R. Br.*; Filices.

Nephrodium variolosum, *Baker.*; Filices.

Nerium odorum, *Soland.*; Apocynaceæ.
Vern.—Pond rajbaha, rajbaha, S.
Cultivated. Flowers white or red.

Nicotiana Tabacum, *Linn.;* Salanaceæ.
Local,—Tumbaku.
Tobacco Eng. Cult.

Nim; Melia Azadirachta, *Linn.*; Meliaceæ.
Local,—Neem, nimi.

Nyctanthes Arbor-tristis, *Linn.*; Oleaceæ.
Vern.—Saparom, S.

Ochna squarrosa, *Linn.;* Ochnaceæ.
Vern.—Champa baha, S.

Ocimum Basilicum, *Linn.* *Var.* thyrsiflorum; Labiatæ.
Vern.—Bharbari, dimbu baha, mali buha, S.

Ocimum canum, *Sims.*; Labiatæ.
Vern.—Bharbari, S.

Ocimum gratissimum, *Linn.*; Labiatæ.
Local,—Băntūlsi, kala tulsi, dimbu phul.

Ocimum sanctum, *Willd.*; Labiatæ.
Local,—Tūlsi, tulsi.
Vern.—Doka, S.

Odina Wodier, *Roxb.*; Anacardiaceæ.
Vern.—Doka, S.; Jiyal, B.
Local,—? Doka.

Okar Jam; Eugenia *sp.*; Myrtaceæ.
Note.—*Jamb* is the generic vern. name of the Eugenias.

Olax nana; *Wall.*: Olacineæ.
Vern.—Merom met, S.

Olax scandens, *Roxb.*; Olacineæ.
Local,—Gute băn.

Olax *sp.*
Vern.—Bir athel, hund, S.

Oldenlandia corymbosa *Linn.*; Rubiaceæ.
Local & B.—Khet papra.

Oldenlandia dichotoma, *Koenig*, ; Rubiaceæ.

Oldenlandia gracilis, *Hk. f.*; Rubiaceæ.

Oldenlandia senegalensis, *Ham*, ; Rubiaceæ.
Vern.—Ilinchin, turam, S.

Oleander; Nerium odorum, *Soland.*; Apocynaceæ.
Vern.—Rajbaha, pond raj baha, S.

Oodul; Cochlospermum Gossypium *DC.* Bixineæ.
Vern.—Hopo, S.; Gŭlgŭl, K. and H.
Torch wood, E.

Ook; Saccharum officinarum *Linn.*; Gramineæ.
Sugarcane, E.
Local,—Katari, ketari, kosiar, gūr ūk.

Ool; Mangifera indica *Linn.*; Anacardiaceæ.
The Mango, Eng.
Local, B. & H.—Am, awm.
Vern.—Ūl, S.

Ophioglossum, vulgatum *Linn.*; Filices.
Vern.—Ot poraini, S.

Oplismenus compositus, *Beauv.*; Gramineæ.

Oplismenus undulatifolius, *Beauv.*; Gramin.

Orka phūl; Exacum tetragonum, *Roxb.*; Gentianaceæ.

Orobanche indica, *Ham.*; Orobanchaceæ.
Vern.—Turi sim, S; Sarsan banda, bhatua ghas, H.
Oroxylum indicum, *Vent.* (Bignonia indica, *Roxb.*) Bignoniaceæ.
Umbrella tree, Eng.
Vern.—Banahata, S.; Bhal supti, H.
Local,—Dak dawa, ginjen.
Oryza sativa, *Linn.*; Gramineæ.
Rice, Eng.
Local,—Dhan.
Vern.—Uri, uri horo, S. (*var.* of sp.)
Cultivated in fields. Baba (cooked rice), Mundari.
Osbeckia chinensis, *Linn.*; Melastomaceæ.
Osbeckia truncata, *D. Don. Var.* Kurzii; Malastomaceæ.
Ottelia alismoides, *Pers.*; Hydrocharideæ.
Local,—Jalkumi.
Ougeinia dalbergioides, *Benth.*; Leguminosæ.
Local,—Pănăn.
Vern.—Rot, S.
Oxalis corniculata, *Linn.*; Geraniaceæ.
Local,—Barangi.
Vern.—Tandi chatom arak, S.
Oxystelma esculentum, *Br.*; Asclepiadeæ.
(Dooghdika, *Sans.*, Kirni, *B.* and Doodhee and Doodh-luta. *Roxb.)*
Padar; Stereospermum suaveolens, *DC.*; Bignoniaceæ.
Local,—Pandar, papre, paydar, siris (*so*), ginjen.
Vern.—Pader, S.
Pæderia fœtida, *Linn.*; Rubiaceæ.
The small of the crushed leaves is stercoraceous.
Pagula. (Specimen lost).
Local—chimti ka sāg.
Păhár ka dudhi; Gouania microcarpa, *DC.*; Rhamneæ.
Paikh; Desmodium pulchellum, *Benth.*; Leguminosæ.
Vern—Bir kapi.
Pălás; Butea frondosa, *Roxb.*; Leguminosæ.
Local.—Paras, pharad, murut.
Vern.—Dare murup, murup, S.; Dhak, B.
Pănăn; Ougeinia dalbergioides, *Benth.*; Leguminosæ.
Vern.—Rot, S.
Păndăn; Dalbergia latifolia, *Willd.*; Leguminosæ.
Vern.—Sat sayer, S.
Pandar, see Padar.

Panicum antidotale, *Retz.*; Gramineæ.
Local,—Bende, bere, misiri.
Vern.—Layo gundli, S.
Panicum auritum, *Presl.*; Gramineæ.
Panicum ciliare, *Retz.*; =Paspalum sanguinale, *Lamk.;* Gramineæ.
Vern—Makŭr jalee, H.
Panicum colonum, *Linn.*; Gramineæ.
Local,—Bur'ndo ghaṇs, dhowra (2).
Vern—Sama ghas, S.; shama, B.
Panicum Crus-galli, *Linn.*; Gramineæ.
Panicum distachyum, *Linn.*; Gramineæ.
Panicum flavidum, *Retz.;* Gramineæ.
Panicum (glaucum, *Linn*); Setaria glauca, *Beauv.:* Gramineæ.
Panicum humile, *Nees.*; Gramineæ.
Panicum indicum, *Linn.*; Gramineæ.
Panicum interruptum, *Willd.*; Gramineæ.
Panicum Isachne, *Roth.*; Gramineæ.
Panicum javanicum, *Poir.*; Gramineæ.
Panicum maximum, *Jacq.*; Gramineæ.
Panicum miliaceum, *Linn.*; Gramineæ.
Vern—Chuna, H. & B.
Panicum miliare, *Lamk.*; Gramineæ.
Vern.—Gūndli, S.
Panicum montanum, *Roxb.*; Gramineæ.
Guinea grass, E.
Panicum myosuroides, *Br.*; Gramineæ.
Panicum nodosum, *Kunth.*; Gramineæ.
Panicum patens, *Linn.*; Gramineæ.
Gūndli, Santali; is Panicum miliare, *Lamk.* (Camp & Watt.)
Panicum (paludosum, *Roxb.*); Panicum proliferum, *Lam;* Gramineæ.
Local,—Gūndli.
Panicum proliferum, *Lam.*; Gramineæ.
Local,—Gūndli, gungri.
Panicum prostratum, *Lamk.*; Gramineæ.
Panicum psilopdium, *Trin*; Gramineæ.
Panicum, punetatum *Burm.*; Gramineæ.
Panicum ramosum, *Linn.*; Gramineæ.
Panicum repens, *Linn.*; Gramineæ.
Panicum setigerum, *Retz.*; Gramineæ.
(Panicum sylvaticum, *Lamk.*); Oplismenus compositus, *Beauv;* Gramineæ.

Panicum trypheron, *Schult*; Gramineæ.

(Panicum verticillatum, *Linn.*); Setaria verticillata, *Beauv.*; Gramineæ.

(Panicum vestitum, *Nees.*); P. villosum, *Lamk.*; Gramineæ.

Panicum villosum, *Lamk.*; Gramineæ.

Vern.—Nari ghas, S.

Panicum sp.; Gramineæ.

Local,—Gungai.

Panicum sp.; Gramineæ.

Vern.—Motha gundli.

Growing among cultivated P. miliare (Camp. & Watt).

Paper; Veronia cinerea, *Less.*; Compositæ.

Local,—Kūnchli.

Papīta; Carica Papaya, *Linn.*; Passifloreæ.

Papaw fruit, E.

Papra; Gardenia latifolia, *Ait.* Rubiaceæ.

Local,—Karhar,

Vern.—Popro, S.; Papro, K.

Papre; Stereospermum suaveolens, *DC.*; Bignoniaceæ.

Local,—Ginjen, padar pandar, siris.

Vern.—Pader, S.

Părás, see Pălás; Butea frondosa, *Roxb.*; Leguminosæ.

Pardawan; Eriolæna spectabilis, *Planch.*; Sterculiaceæ.

Local,—Bhāwăt.

Parhi, Cissampelos Pareira, *Linn.*; Menispermaceæ.

Vern.—Tejo malla, S.

Parkinsonia aculeata, *Linn.*; Leguminosæ.

Paro; Zingiber Cassumunar, *Roxb.*; Scitamineæ.

Parola; Clerodendron Siphonanthus, *Br.*; Verbenaceæ.

Parsati; Jussiæa suffruticosa, *Linn.*; Onagraceæ.

Paspalum longiflorum, *Retz.*; Gramineæ.

Paspalum pedicellare, *Trin.*; Gramineæ.

Paspalum Royleanum, *Nees.*; Gramineæ.

Paspalum Sanguinale, *Lamk.*; (Panicum ciliare, *Retz.*,) Gramineæ.

Vern.—Makur jalee, H.

Paspalum scrobiculatum, *Linn.*; Gramineæ.

Local.—Kodo.

Vern.—Janhe, S.; Kodo H. Janhe chanle, S. for the husked grain (Chanle-chăwăl=husked rice), H.

Pătal chatta ; Cheilanthes farinosa, *Kaulf.* ; and Cheilanthes tenuifolia, *Swartz.* ; Filices.
Local,—Bhui nim.

Pavetta indica, *Linn.* ; *Var.* tomentosa ; Rubiaceæ.
Local,—Cherei gora, inderjow, menda.
Vern.—Budhi tilai, budhi ghasit, S.

Pea ; Pisum arvense L. cultd. P. sativum, *Linn.* ; Leguminosæ.
Local,—Matar, *q.v.*

Peeyar ; Buchanania latifolia, *Roxb.* ; Anacardiaceæ.
Local,--Beāl pŭtti, Peyal, cheronji (the fruit).
Vern.—Tarop, S., Tarum, *K.* ; Piyar, piyal, biyala, chironji (the fruit) H. ; Piyal, B. ; Pial, Bhumij, ; Peera, Kharwar.

Pennisetum cenchroides, *Rich.* ; Gramineæ.
Local,—Ludia băn.

Pennisetum parviflorum, *Trin.* ; (P. imberbe. *Edgew.*) ; Gramineæ.

Pennisetum setosum, *Rich.* ; Gramineæ.

Pennisetum typhoideum, *Rich.* ; (Panicum spicatum, *Roxb.*) ; Cult. Gramineæ.
Local,—Bŭjera or bŭjra.
Vern.—Kasa jouar, H. ; Bajra, S.

Pentapetes phœnicia, *Linn.* ; Sterculiaceæ.
Vern.—Bare baha, S.

Perar ; Randia uliginosa, *DC.* ; Rubiaceæ.
Local,—Katai.

Peristrophe bicalyculata, *Nees.* ; Acanthaceæ.

Perotis latifolia, *Ait.* ; Gramineæ.

Phalanda ; Hemigyrosa canescens, *Thw.* ; Sapindaceæ.

Phalti ; Calotropis gigantea, *DC.*, Asclepiadeæ.
Local,—Mădār.
Vern.—Akauna, S.

Pharad ; see Pălās. Butea frondosa, *Roxb.* ; Leguminosæ

Phaseolus aconitifolius, *Jacq.* ; Leguminosæ.
Vern.—Bir mung, bir moch, moch, S. ; Moth, H.

Phaseolus calcaratus, *Roxb.* ; Leguminosæ.
Vern.—Sutri, S.

Phaseolus Mungo, *Linn.* ; Leguminosæ.
Local,—Mūng dall.
Vern.—Mung, bir sang ramra, S. ; urid, H.

Phaseolus vulgaris, *Linn.* ; Leguminosæ.
Local,—Paras bean.
Haricot, Kidney bean, E.

Phătkăl ; Artocarpus integrifolia, *Linn.* ; Urticaceæ.
Jak-fruit tree, Eng.
Local,—Kătăl.
Vern.—Kanthar, S. ; Poros, Kol. ; Kanthal, kathal, chakk, panas, H. ; Kathal, B.
Phœnix acaulis, *Ham.* ; Palmeæ.
Local,—Băn kajūr.
Floor-mats of bungalows made of the leaves plaited.
Phœnix sylvestris, *Roxb.* ; Palmeæ.
Local,—Kajūr, kita.
Vern.—Khijur, S.
Phul bărhi ; Andropogon serratus, *Thunb.* ; Gramineæ.
Brooms are made of it.
Phyllanthus Emblica, *Linn.* ; Euphorbiaceæ.
Local,—Aoṇla, amra.
Vern.—Meral, S. ; Aura, K.
(Phyllanthus lanceolarius, *Muell.*); Glochidion lanceolarium, *Dalz.* ; Euphorbiaceæ.
Local,—Chikni.
Vern.—Bania kandhum, S.
Phyllanthus Niruri, *Linn.* ; Euphorbiaceæ.
Local,—Băn aoṇla, bănjiran, arjuni, jiran ban.
Phyllanthus perdulus, *Roxb.* ; Euphorbiaceæ.
Phyllanthus simplex, *Retz.* ; Euphorbiaceæ.
Vern.—Tandi meral, S.
Phyllanthus urinaria, *Linn.* ; Euphorbiaceæ.
Physalis minima, *Linn.* ; Solanaceæ.
Local,—Ranipucco.
Vern.—Handi khandi, S.
Pimpinella elata, *Dalz.* ; Umbelliferæ.
Pipal, Pipar (1) ; Ficus religiosa, *Linn.* ; Urticaceæ.
Local,—Hesa.
Vern.—Hesak, S. ; Pipar, K.
Pipar (2) ; Anisochilus carnosus, *Wall.* ; Labiatæ.
Local,—Chota pipar.
Piper Betle, *Linn.* ; Piperaceæ. Cult.
Vern.—Pan.
Betle pepper, E.
Piper longum, *Linn.* ; Piperaceæ.
Vern.—Ralli, S.
Pisum, *sp.* ; see Mătăr.
Pithour ; Zizyphus rugosa, *Lamk;* Rhamneæ.

Plectranthus incanus, *Link*; Labiatæ.

Plectranthus, *sp.* ?

Vern.—Damka duri, S.

Plumbago capensis, *Thunb.*; Plumbagineæ.

Flower blue, in branches, a com. climber in garden.

Plumbago zeylanica, *Linn.*; Plumbagineæ.

Got on Sillee and Sandi-Mandi road, most probably *wild.*

Plumeria acutifolia, *Poir.*; Apocynaceæ.

Sometimes somewhat rose-coloured outside.—*Kurz.*

Local,—Gūlainchi, chămpa (?)

Vern.—Gulanj baha, S.

Another *Champa* (1) is Michelia Champaca, *Linn.*

Pogonātherum saccharoidium, *Beauv.*; Gramineæ. (Camp & Watt.)

Pogostemon plectranthoides, *Desf.*; Labiatæ.

(Poinciana pulcherrima, *Linn.*); Cæsalpinia p. *Swartz*; Leguminosæ.

Poinciana regia, *Bojer.*; Leguminosæ.

Gold mohur E., Mascarene Flamboyánt, W. J.

Poinsettia pulcherrima, *R. Grah.*; Euphorbiaceæ.

Pollia sorzogonensis, *Endl.*; Commelineaceæ.

Pollinia argentea, *Trin.*; (P. tristachia, *Thw.*); Gramineæ.

(Pollinia eriopoda, *Hance.*); Ischæmum, angustifolium, *Hack.*; Gramineæ.

Vern.—Chero ghas, bachkom, S.; Sabe, H.

The material from which the common twine of the district is made. (Camp. & Watt.)

Polyalthia cerasoides, *Benth & Hk. f.*; Anonaceæ.

Vern.—Panjon, S.

Polyalthia longifolia, *Benth & Hk. f.*; Anonaceæ.

Local,—Deb daru, deodar.

Vern.—Deodar, K.

Planted as avenue, Doranda.

Polycarpæa corymbosa, *Lamk. Var.* aurea, *Wight.*; Caryopylleæ.

Vern.—Janhe nanjom, S.

Polygala chinensis, *Linn.*; Polygaleæ.

Vern.—Gaighura, S.

Polygala crotalarioides, *Ham.*; Polygaleæ.

Vern.—Lil kathi.

Polygala erioptera, *DC.*; Polygaleæ.

Polygala glaucoides, *Linn.*; Polygaleæ.

Polygonum barbatum, *Linn.*; Polygonaceæ

Polygonum capitatum, *Ham.* ; Polygonaceæ.
Polygonum chinense, *Linn.* ; Polygonaceæ.
Polygonum glabrum, *Willd.* ; Polygonaceæ.
Local,—Manj, machli ka manj.
Vern.—jioti, sauri ark, S.
Polygonum (indicum, *Roxb.*) ; Polygonaceæ.
Vern.—Rani phul, S.
Polygonum plebejum, *Br.* ; Polygonaceæ.
Polygonum *sp.* ; Polygonaceæ.
Local.—Hara pota.
Polypodium multilineatum, *Wall.* ; Filices.
Polypodium proliferum, *Roxb.* ; Filices.
Pongamia glabra, *Vent.* ; Leguminosæ.
Local,—Karan
Vern.—Kurunji, S.
The seeds produce a smoky oil much used for burning in lamps in Chutia Nagpur. Planted near villages, along the village roadsides.
Borana paniculata, *Roxb.* ; Convolvulaceæ.
Silver creeper, Eng.
Local,—Jharo.
Vern.—Panjot nari, S.
Porho ; Ficus hispida, *Linn. f.* ; Urticaceæ.
Local,—Dūmăr.
Portulaca oleracea, *Linn.* ; Portulacaceæ.
Vern.—Mota seric alung, S.
Portulaca quadrifida, *Linn.* ; Portulacaceæ.
Portulaca tuberosa, *Roxb.* ; Portulacaceæ.
Portulaca *sp.* ; Portulacaceæ. "A troublesome weed. Flower pale purple, $\frac{1}{4}$" to $\frac{1}{2}$"." *(Watt.)*
Potamogeton crispus, *Linn.* ; Naiadaceæ.
Potamogeton natans, *Linn.* ; Naiadaceæ.
Potato ; Solanum tuberosum, *Linn.* ; Solanaceæ.
Local,—Alu, ārū, which name is also applied to *yams*.
Pōtē ; Root bark, used in *gŏrmi*.
Tree,—leaves 12", diamond-shaped.
Pouzolzia pentandra, *Benn.* ; Urticaceæ.
Premna herbacea, *Roxb.* ; Verbenaceæ.
Vern.—Kadamet, S.
Premna latifolia, *Roxb. Var.* cuneata. Verbenaceæ.
Vern.—Dangra seya, S.
Psoralea corylifolia, *Linn.* ; Leguminosæ.

Pterocarpus Marsupium, *Roxb.*; Leguminosæ.
Local,—Beāl.
Vern.—Murga, S.

Pterrspermum acerifolium, *Willd.*; Sterculiaceæ.
Vern.—Mach kunda.

Pterospermum suberifolium, *Lamk.*; Sterculiaceæ.

Pueraria tuberosa, *DC.*; Leguminosæ.
Local,—Bendo.
Vern.—Jang tira, tirra, S; patal kohnda, S. & H.

Pulicaria angustifolia, *DC.*; Compositæ.
Local,—Hurhuria.

Punial, punial aombo; Andropogon sp.
Root bruised and rubbed into the skin.

Punnan; see Pănăn.

Putranjiva Roxburghii, *Wall.*; Euphorbiaceæ.
Vern.—Pitoj, S.

Putri; Croton oblongifolius, *Roxb.*; Euphorbiaceæ.
Vern.—Gote, S., Poter; K.

(Quamoclit); Ipomæa Quamoclit, *Linn.*; Convolvulaceæ.

Quisqualis indica, *Linn.*; Combretaceæ.
Cultivated in gardens, com. climber.

Rahar dall; Cajanus indicus, *Spreng.*; Leguminosæ.
Maghi ripe in January; *Chaitali* in March and *Aghanwi* in November, are three varieties: (C. & W.)
Vern.—Raher, S.; Laher, N.; Oroha, B.

Rai datun; Heptapleurum venulosum, *Seem.*; Araliaceæ.

Ram dāṭṇ; Smilax macrophylla, *Roxb.*; Liliaceæ.
Local,—aru, jungli aru, ran pawan.

Ram Kurti (1); Atylosia mollis, *Benth.*; Leguminosæ.
Vern.—Bir malhan, S.

Ram Kurthi (2); Glycine Soja. *Sieb.* & *Zucc.*; Leguminosæ.
*Vern.*Pond. White *var.* Fond disom horec, S.; Black *var.* Hende disom horec, S., Ram Kurti, H.

Randia dumetorum, *Lamk.*; Rubiaceæ.
Local,—Mowna.
Vern.—Boi bindi, loto, S.

Randia uliginosa, *DC.*; Rubiaceæ.
Local,—Perar, Katai.
Vern.—Pinde, S.; Pindar, K.

Rani pucco; Physalis minima, *Linn.*; Solanaceæ.
Vern.—Handi khandi, S.

Ran pāwăn ; Smilax macrophylla, *Roxb.;* Liliaceæ.
Local,—Aru, jungli aru, ram datun.
Raphanus sativus, *Linn.;* Cruciferæ. Com. cult.
Local,—Mūli.
The Radish, E.
Rata băn ; Andropogon Schœnanthus, *Linn.;* Gramineæ.
Vern.—Nanha dhuri ghas, S.
Local,—Bara kher, bharăndo kher.
Geranium grass, Rusa oil grass, Oil of Ginger grass, Eng.
Rătăn gowra ; Elæodendron glaucum, *Pers.;* Celastrineæ.
Vern.—Neuri, S., Thanki, K.
Rati ; (seeds) Abrus precatorius, *Linn;* Leguminosæ.
Rat kat jănŭm ; Solanum xanthocarpum, *Schrad & Wendl.;* Solanaceæ.
? Local,—Sial kanta (Jackal thorn).
Vern.—Rangaini janum, S.
Reinwardtia trigyna, *Planch.;* Lineæ.
Local,—Lungora.
Reri ; Ricinus communis, *Linn.;* Enphorbiaceæ.
Vern.—Eradom, S.
Castor oil plant, *Eng.*
A dwarf variety grown in fields ; seen in Singbhum.
Rethi ; Sapindus Mukorossi, *Gærtn.;* Sapindaceæ.
Ricinus communis, *Linn;* Euphorbiaceæ.
Local,—Reri.
Vern.—Eradom, S.
The Castor oil plant, *Eng.*
Rivea hypocrateriformis, *Chois.;* Convolvulaceæ.
Rivea ornata, *Chois.;* Convolvulaceæ.
Rohina ; Soymida febrifuga, *A. Juss.;* Sterculiaceæ.
Rori ; Mallotus philippinensis, *Mucll.; olim* Rottlera tinctoria ; Euphorbiaceæ.
Rosa involucrata, *Roxb.;* Rosaceæ.
Rūch mūchi ; undetermined.
Ruellia suffruticosa, *Roxb.;* Acanthaceæ.
Vern.—Chaulia, S.
Rugura ; Geaster sp.; Fungi.
Rumex dentatus *Camp.;* Polygonaceæ.
Rumex nigricans, *Hookf.* Polygonaceæ.

Rungia perviflora, *Nees.;* Acanthaceæ.
Local,—Līla Jān.
Russelia juncea *Zucc.;* Scrophularineæ. Cult. Exotic. Common in gardens.
Saccharum arundinaceum, *Retz.;* Gramineæ.
Local,—? Munj. Sar ghas, S.
Saccharum Narenga, *Ham.;* Gramineæ.
Local,—Mūnj.
Saccharum officinarum, *Linn.;* Gramineæ.
Sugarcane, E.
Cultivated in fields.—Planted, irrigated.
Local,—Kătāri, Ketari, Kosear, Ook, ? gūr.
Vern.—Gunna, H.
Gūr, the crude product, is sometimes used as the name of the plant.
Saccharum spontaneum, *Linn.;* Gramineæ.
Saccopetalum tomentosum, *Hk. f. and T.;* Anonaceæ.
Local,—Kari.
Sagittaria sagittæfolio, *Linn.;* Alismaceæ.
Saida; Hedychium coronarium, *Koen.;* Scitamineæ.
Saki; Adenostemma viscosum, *Forst.;* Compositeæ.
Sakna; Sal; Shorea robusta, *Gærtn.;* Dipterocarpeæ.
Local,—Săkna, surjūm.
Vern.—Sarjom, S; Sakhna, Sal, H. The red resin, Sarjom lori S.; Dammar resin, Eng. Used in varnish, incense.
Salai; Boswellia serrata, *Roxb.;* Melisceæ.
Local,—Sălei, sally: The gum Lubān.
Frankincense, Olibanum, Eng.
Vern.—Salga, S., K., H. The wood valuable for gunpowder-charcoal. Stakes of fences made of this wood sprout and grow.
Salix tetrasperma, *Roxb.;* Salicineæ.
Vern.—Gada sigrik, S.
Salomonia oblongifolia *DC.;* Polygaleæ.
Săn,—see Sŭn; Crotalaria juncea, *Linn.;* Leguminosæ.
Sauromatum guttatum, *Schott;* Aroideæ.
Sansevieria Roxburghiana, *Schult.;* Hæmodoraceæ.
Sapindus Mukorossi, *Gærtn.;* Sapindaceæ.
Local,—Rethi. Trees, to 40 ft. cult. in Rajah's garden, Jaspur-nagar.
Saponaria Vaccaria, *Linn.;* Caryophylleæ.
Vern.—Musna, S. Cultivated. An oil seed.

Sarnega ; Curcuma cordata, *Wall ;* Scitamineæ.
Vern.—Sarănga, (Sar'nga).
Sarjum,—see Sāl.
Sarpank ; Tephrosia purpurea, *Pers. ;* Leguminosæ.
Sasapora ; Embelia robusta, *Roxb. ;* Myrsineæ.
Local,—Babirŭng.
Satawar ; Asparagus racemosus, *Roxb. ;* Liliaceæ.
Sauromatum guttatum, *Schott. ;* Aroideæ.
Saussurea candicans, *Clarke ;* Compositæ.
Schleichera trijuga, *Willd. ;* Sapindaceæ.
Local,—Kūsūm.
Vern.—Baru, S.; Kūsūm, H. Another *Kūsūm* (L), is Carthamnus tinctorius, *L.*
Scindapsus officinalis, *Schott. ;* Aroideæ.
Vern.—Dhara jhapak, S.
Scirpus articulatus, *Linn. ;* Cyperaceæ.
Scirpus erectus, *Poir. ;* Cyperaceæ.
Scirpus grossus, *Linn. Var.* Kysoor (sp.) *Roxb ;* Cyperaceæ.
Scirpus Isolepis, *Boeck ;* Cyperaceæ.
Scirpus Michelianus, *Linn. ;* Cyperaceæ.
Scirpus mucronatus, *Linn. ;* Cyperaceæ.
Scirpus squarrosus, *Linn. ;* Cyperaceæ.
Scirpus supinus *Linn. ;* Cyperaceæ.
Scleria caricina, *Benth. ;* Cyperaceæ.
Scleria elata, *Thw. ;* Cyperaceæ.
Scleria hebecatpa, *Nees. ;* Cyperaceæ.
Scleria oryzoides, *Presl. ;* Cyperaceæ.
Scleria pergracilis, *Kunth. ;* Cyperaceæ.
Scleria tenellata, *Willd. ;* Cyperaceæ.
Scoparia dulcis, *Linn. ;* Scrophularineæ.
Sebastiana Chamælea, *Muell. Arg. ;* Euphorbiaceæ.
Sej păt ; ? Euphorbia species ; Euphorbiaceæ.
? *Vern.*—Sij, B.
Sekoie ; Hoppea dichotoma, *Willd ;* Gentianaceæ.
Local,—Sekoy.
Selaginella rupestris, *Spreng ;* Lycopodiaceæ.
Selaginella tenera, *Spr ;* Lycopodiaceæ.
Semecarpus Anacardium, *Willd ;* Anacardiaceæ.
Local,—Belwa soso.
Vern.—Soso, S.
Senduār ; Vitex Negundo, *Linn ;* Verbenaceæ.
Vern.—Sinduari, S., K., H.; Bhadu, marak, S.

Serho ; Iseilema Wightii, *Anderss.* ; Gramineæ.
Sesamum indicum, *DC.* ; Pedalineæ.
Local,—Til.
Vern.—Tilmin, kat tilmin, S. "Tila Sanscrit. Gingeli *Eng.* on Coromandel Coast." *Roxb.* Grown in fields for oil-seed. "Krishna til of the Hindus."—*Roxb.*
Sesbania aculeata, *Pers.* ; Leguminosæ.
Sesbania ægyptiaca, *Pers.* ; Leguminosæ.
Setaria glauca, *Beauv.* ; Gramineæ.
Vern.—kukra, S.
Setaria italica, *Beauv.* ; Gramineæ.
Vern.—Erba, S. ; kauni, H.
Setaria verticillata, *Beauv.* ; Gramineæ.
Vern.—Bir kauni, S.
Sher, Shere ; Smilax zeylanica, *Linn.* ; Liliaceæ.
Shorea robusta, *Gærtn.* ; Dipterocarpeæ.
Local,—Chal, sakua, sal, sarei, sarjum.
Vern.—Sarjom, S.; sakhua, sal, H.
Sicat ; Oroxylum indicum, *Vent.*; Bignoniaceæ.
Local,—Dak dawa, ginjen.
Vern.—Banahata, S.; Bhal supti, H.
Sida carpinifolia, *Linn* ; Malvaceæ.
Sida humilis, *Willd.*; Malvaceæ.
Vern.—Bir-or tandi bariar, bariar, jokha sakam, S.
Sida rhombifolia, *Linn* ; Malvaceæ.
Siegesbeckia orientalis, *Linn* ; Compositæ.
Local,—Bhuseri.
Siliari ; Celosia argentea, *Linn.*; Amarantaceæ.
Sinapis (see Brassica).
Vern.—Sirsū, sirsa, rai. Mustard, *Eng. e.a.* (Brassica campestris, *L.*). *Vern.*—Lutni, Thadia turi, S. B. juncea, *Hk. f. & T.*
Local,—Sersa, sirsu. *Vern.*—Rai, S.
Sirguja ; Guizotia abyssinica, *Cass.* ; *olim* G. oleifera, *DC.* and Verbesina sativa, *Roxb.* ; Compositæ.
Local,—Jítingi (or ginjeri) (1) sirgujia, ram til, kala til. Black niger, *Eng.* (the seed).
Vern.—Surguja, S., K., H.
Siris (1); Albizzia Lebbek, *Benth.*; Leguminosæ.
Siris (2) ; Stereospermum suaveolens, *DC.* ; Bignoniaceæ.
Local,—Ginjen (2) padar, papre.
Vern.—Pader, S.

Sirle; Flacourtia, Ramontchi, *L'Her.;* Bixineæ.

Sirsa, Sirsu; Brassica juncea, *Hk. f. & T.;* B. alba, *H. f. & T.* and B. nigra, *Koch.;* Cruciferæ.

Local,—Rai.

Vern.—Rai, S.

Sital hemp; "Agave Rigida sisalana"; Amaryllideæ. Cult. at Palandu.

Sissū; Dalbergia Sissoo, *Roxb.* Leguminosæ.

Local,—Shishām, shisham.

Sisu-ban; Fimbristylis, diphylla *Vahl.*; Cyperaceæ.

Local, Chunki khaksi ban.

Siuri janum; ? Mimosa species. Seed alone collected on Chutia Palughat 1,500—2,000 feet: *stem* very prickly; *flrs.* said to be *white.*

Smilax aspera, *Linn.;* Liliaceœ.

Smilax macrophylla, *Roxb.*; Lilliaceæ.

Smilax Roxburghiana *Wall.;* Liliaceæ.

Smilax zeylanica, *Linn.;* Liliaceæ.

Smithia sensitiva, *Ait.;* Leguminosæ.

Local,—Kijuli (3).

Solanum indicum, *Linn.;* Solanaceæ.

Local,—Kūtūa.

(Solanum lycopersicum, *Willd.*); Lycopersicum esculentum, *Mill,* Solanaceæ.

Tomato, love apple; *Eng.;*

Local,—Belati bengan.

Solanum Melongena, *Willd.;* Solanaceæ.

Egg plant, brinjal, *Eng.*

Vern.—Bengan, H. Beugun.

Solanum nigrum, *Linn.;* Solanaceæ.

Solanum tuberosum, *Linn.;* Solanaceæ.

The Potato, *Eng.* Local,—Alu, aru, alua.

Vern.—Dahu, S., K. Cult. in gardens. The tops used as a potherb by natives and the tubers pickled.

Solanum xanthocarpum, *Schrad & Wendl.;* Solanaceæ.

Local,—Rat kat janum, siăl kanta.

Vern.—Rangani janum, S.

Senchus arvensis, *Linn.;* Compositæ.

Vern.—Bir barangon.

Sonerila tenera, *Royle.;* Melastomaceæ.

Local,—Lawangla.

Son pokri, Symplocos racemosa, *Roxb.*; Styraceæ.
Local,—Lōdh, tarop.
Vern.—Lodam, S.; Lodh, K., H.
Sopubia delphinifolia, *G. Don.*; Scrophularineæ.
Vern.—Dak kadur, S.
Sorghum, see Andropogon, *Linn.*; Graminæ.
Soso; Semecarpus Anacardium, *Willd.*; Anacardiaceæ.
Local,—Belwa, soso.
Vern.—soso, S.
Soymida febrifuga, *A. Juss.*; Sterculiaceæ.
Local,—Rohina.
Vern.—Ruhen; S.; Rakat rohen K., H.; Rohia, B.
Spatholobus Roxburghii, *Bth.*; Leguminosæ.
Local, - Bendo chandan.
Vern.—Bando (fruit), chihutlar (tree), S., H. spear grass, E.
Spermacoce hispida, *Linn.*; Rubiaceæ.
Vern.—Pitua arak, S.
Spermacoce stricta, *Linn.*; Rubiaceæ.
Local,—Getia.
Sphaeranthus indicus, *Linn.*; Compositæ.
Vern.—Belaunja, S.
Spilanthes Acmella, *Linn.*; Compositæ.
Local,—Barbăria.
(Spodiopogon obliquivalvis, *Nees*); Ischæmum ciliare, *Retz*; Gramineæ.
(Sponia) Trema orientalis, *Blume.*; Sponia orientalis: *Planch.* Urticaceæ.
(Sponia) Trema amboinensis, *Blume.*; (Sponia velutina; *Planch.* and *Miq.*); Urticaceæ.
Spondias mangifera, *Willd.*; Anacardiaceæ.
Local,—Amra.
Hog plum, *Eng.*
Sporobolus diander, *Beauv.*; Gramineæ.
Local,—Bherendi.
Stachytarpheta indica, *Vahl.*; Verbenaceæ.
Stephegyne parvifolia, *Korth.*, Rubiaceæ,
Local,—Guria.
Vern.—Gore, S.
Sterculia, colorata, *Roxb.*; Sterculiaceæ.
Vern.—Sisi, K., Bollua, walena, H; Mula, B.
Sterculia urens, *Roxb.*; Sterculiaceæ.
Vern.—Telhec, S.; Kaunji, K.

Sterculia villosa, *Roxb.*; Sterculiaceæ.
Vern.—Ganjher, S.; Pironja, sisi, walkom, K., Udal, H.
Stereospermum suaveolens, *DC.*; Bignoniaceæ.
Local,—Ginjen(2) Pădăr, păpre, siris.
Vern.—Pader, S.
(Stratiotes); Ottelia *sp.*; Hydrocharideæ.
Streblus asper, *Lour.*; Urticaceæ.
Vern.—Sahra, S.
Strobilanthes auriculatus, *Nees.*; Acanthaceæ.
Vern.—Gada Kalha, harna pakor, S.
Strobilanthes sabinianus, *Nees.*; Acanthaceæ.
Strychnos Nux-vomica, *Linn.*; Loganiaceæ.
Local,—Kūchla. Nux-vomica, and Strychnia-tree E.
Strychnos potatorum, *Linn.*; Loganiaceæ.
Vern.—Kuchla, S. & H.
Stylidium tenellum, *Sw.* *Var.* minima; Stylidieæ.
Sugarcane; Saccharum officinarum, *Linn.*; Gramineæ, *q.v.*
Sun; Crotalaria juncea, *Linn.*; Leguminosæ.
Local,—Săn.
Vern.—Son, S & B; San, H.
A good fibre for fishing-nets, said to stand water well.
Sunia; Leptodesmia congesta, *Benth*; Leguminosæ.
Sūn Sūnia; Marsilea quadrifolia, *Linn*; Marsileaceæ.
Vern.—Suni Shunnuka, Sanscrit.
Symplocos racemosa, *Roxb*; Styraceæ. A dye.
Local,—Lodh, son pokri, tarop.
Vern.—Lodam, S; Lodh, K & H.
Tabernaemontana coronaria, *R. Br.*; Apocynaceæ.
Local,—Toaha.
Tacca pinnatifida, *Linn.*; Taccaceæ.
Vern.—Dhai, S.
Talgach; Borassus flabellifer, *Linn.*; Palmeæ.
Fan palm, toddy palm, *Eng.*
Local,—Tar,-tari-gach.
Tal muli; Elephantopus scaber, *Linn.*; Compositæ, *q.v.*
Tamarindus indica, *Linn,*; Leguminosæ.
Local,—Imli.
Vern.—Jojos, S.; Joj, K.; Teter, H.
Tamarix dioica, *Roxb.*; Tamariscineæ.
Local,—Jow.
Tamarix ericoides, *Rottl.* Tamariscineæ.
Local,—Jow.

Targach ; see Talgach.

Tea ; see Camellia.

Tecoma jasminoides, *Lindl.*; Bignoniaceæ. Cult.

Tecoma velutina, *Lindl.*; Bignoniaceæ. Cult.

Tectona grandis, *Linn.*; Verbenaceæ.

Teak, *Eng.*

Vern.—Saguna, S. ; Segoon, B.

Telei; Wendlandia tinctoria, *DC.*; Rubiaceæ.

Local,—Tilei phul.

Tephrosia purpurea, *Pers.*; Leguminosæ.

Local,—Săr pănk.

Terminalia Arjuna, *W. & A.*; Combretaceæ. A *Myrobolan* of commerce.

Local,—Arjūu.

Vern.—Kauha, S & K ; Matha Sura, S.

Terminalia belerica, *Roxb.*; Combretaceæ. A *Myrobolan* of commerce.

Local,—Bahera.

Vern.—Lopong, S.

Terminalia Catappa, *Linn.*; Combretaceæ.

Local,—Bodām, desi bodām. Country almond.

Terminalia Chebula, *Retz*; Combretaceæ.

Local,—Hăṛi, hari taki (the fruit).

Vern.—Rol, S.; Harla, H.

Terminalia tomentosa, *Bedd.*; Combretaceæ.

Local,—Asăn.

Vern.—Atnak, S. ; Matnak, K.

(Tetranthera laurifolia, *Facq.*); Litsaea, sebifera, *Pers.*; Laurineæ.

(Tetranthera monopetala, *Roxb.*) Litsaea polyantha, *Juss.*; Laurineæ.

Vern.—Pojo ; S.

Thalictrum javanicum, *Bl.*; Ranunculaceæ.

(Thea ; Camellia Thea, *Link.*); Camellia theifera, *Griff.*; Ternstroemiaceæ.

Tea, *Eng.* Local—Cha. Cult., in Tea gardens ; Hazaribagh, Ranchi, Netter hât, Parasnath, etc.

Thespesia Lampas, *Dalz & Gibs.*; Malvaceæ.

Local,—Băn kapas.

Vern.—Bon kaposi, S.

Thevetia, neriifolia. *Fuss.*; Apocynaceæ.

Vern.—Berenjo, S ; Zŭrd Kunel, H.

Thunbergia alata, *Bojer.*; Acanthaceæ.
Thunbergia grandiflora, *Roxb.*; Acanthaceæ.
Thunbergia laurifolia, *Lindl.*; Acanthaceæ. Cult.
Thysanolæna Agrostis, *Nees.*; Gramineæ.
Vern.—Karsar, S.
Til; Sesamum indicum, *Linn.*; Pedalineæ.
An oilseed, widely cultivated.
Vern.—Tilemin, S.; Gingely, *Roxb.*
Tirchiti; Achyranthes aspera, *Linn.*; Amarantaceæ.
Local,—Chinchiri.
Vern.—Chipchirit, S.
Tiril; Diospyros melanoxylon, *Roxb.*; Ebenaceæ. Tiril is *Mundari.*
Local,—Khord.
Tirio; Pimpinella elata, *Dalz.*; Umbelliferæ.
Local,—Marcheia.
Tisi; Linum usitatissimum, *Linn.*; Lineæ.
Toaha; Tabernæmontana; see above.
Tobacco; see Nicotiana.
Toon; Cedrela Toona, *Roxb.*; Meliaceæ.
Local,—Tuni.
Vern.—Alga jari, S.
Toont; Mulberry, Eng.; Morus *sp.*; Urticaceæ.
Torenia cordifolia, *Roxb.*; Scrophularineæ.
Torenia peduncularis, *Benth.*; Scrophularineæ.
Toriar; Vallaris Heynei—*Spreng*; Apocynaceæ. V. dichotoma, *Wall.*
(Tradescantia sp.) Commelina *species*; Commelinaceæ. Tradescantia discolor. Cult.
Tragia involucrata, *Linn.*; Euphorbiaceæ.
Vern.—Sengel sing, S.
Trema amboinensis, *Bl.*; Urticaceæ.
Trema orientalis, *Bl.*; Urticaceæ.
Trichodesma indicum, *Br.*; Borragineæ.
Vern.—Het mudia, S.
Trichodesma zeylanicum, *Br.*; Borragineæ.
Trigonella Fœnum-graecum, *Linn*; Leguminosæ.
Local,—B. Methi.
Triumfetta rhomboidea, *Jacquem.*; Tiliaceæ.
Tulsi; see Ocimum *sp.*; Labiatæ.
Tuni; see Toon.
Tupistra aurantiaca, *Wall.*; Liliaceæ.

Turnera ulmifolia, *Linn.;* Turneraceæ. Cult.
(Ulmus integrifolia, *Roxb.*) Holoptelea iutegrifolia, *Planch.*: Urticaceæ.
Local,—Chiryta.
Ungul ; Alysicarpus vaginalis, *DC.;* Leguminosæ.
Uraria lagopoides, *DC.*, Leguminosæ.
Local,—Mahadeo jăt.
Vern.—Lopong herac, toyo chanadol, S.
Uraria lagopus, *DC.;* Leguminosæ.
Urena lobata, *Linn.;* Malvaceæ.
Vern.—Bidhi janitet, S.
Urena repanda, *Roxb.;* Malvaceæ.
Vern.—Sikuar, S.
Urena sinuata, *Linn ;* Malvaceæ.
Local,—Bheri lāt.
Vern.—Mota bhedi janitet, S ; Lotloti, H.
Utricularia bifida, *Linn.;* Lentibularieæ.
Local,—Masuria.
Vern.—Arak jhawar, S.
Utricularia hirta, *Klein ;* Lentibulareaceæ.
Local,—Masuria.
Vallaris dichotoma, *Wall.;* Apocynaceæ.
Local,—Toriar.
Vanda Roxburghii, *Br.;* Orchideæ.
Local,—Banda.
Vern.—Dare banki, S.
Vandellia crustacea, *Benth.;* Scrophularineæ.
Vanilla planifolia, *Andrews.;* Orchidaceæ. Cult.
Ventilago calyculata, *Tulasne.;* Rhamneæ.
Local,—Sakan.
Vern.—Bonga Sarjom, S. Raidharie, H.
Vernonia anthelmintica, *Wild.;* Compositæ.
Vernonia cinerea, *Less.;* Compositæ.
Local.—Cŭnchli, kănchli, pāpăr.
Vern.—Bahu tuturi, Barangom, bir lopong arak, Durya arak, Jhur juri, S.
Vernonia Roxburghii, *Less.;* Compositæ.
Local,—Ghetia phul.
Vernonia teres, *Wall. Var.* subsessilis. Compositæ.
Vern.—Char sira, S.
Vicia Faba, *Linn.;* Leguminosæ. Cult.
Local,—Sem, Broad bean, E.

Vicia hirsuta, *Koch.*; Leguminosæ. Cult.
Vern.—Tiririte, S.
Vicoa auriculata, *Cass.*; Compositæ.
Local,—Arguni.
Vigna Catjang, *Endl.*; Leguminosæ. Cult.
Vern.—Ghangra, S; Ramhi Kolai, B.
Vigna vexillata, *Benth*; Leguminosæ.
Vern. Serwang, birghangra (the fruit), S.
Vinca pusilla, *Murr.*; Apocynaceæ.
Vinca rosea, *Linn.*; Apocynaceæ. Cult. in all gardens; flowers red and white.
Viscum articulatum, *Burm. f.*; Loranthaceæ.
Vern.—Katkom janga, S.; Mistletoe, E.
Viscum monoicum, *DC.*; Loranthaceæ.
Vern.—Pet chamra banda, S; Mistletoe, E.
Viscum orientale, *Willd.*
Vern.—Banda, S, K, H; Mistletoe, E.
Vitex Negundo, *Linn.*; Verbenaceæ.
Local,—Senduar.
Vern.—Bhadu, marak, S.
Vitex peduncularis, *Wall.*; Verbenaceæ.
Vitex trifolia, *Linn.*; Verbenaceæ.
Vitis adnata, *Roxb.*; Ampelideæ.
Vern.—Bod lar nari, S.
Vitis lanata, *Roxb.*; Ampelideæ,
Vern.—Kolo, kolo nari, S.
Vitis latifolia, *Roxb.*; Ampelideæ.
Vern.—Ic ewer, ic er, S.
Vitis tomentosa, *Heyne.*; Ampelideæ.
Vern.—Ghora lidi, S.
Vitis sp.; ? auriculata, *Roxb.*; Ampelideæ.
Local,—Korkota.
Vitis vinifera, *Linn.*; Ampelideæ.
The grape vine, E.
Local,—Ŭngūr, Ăngūr.
Wedelia Wallichii, *Less.*; Compositæ.
Wendlandia exserta, *DC.*; Rubiaceæ.
Local,—Kudi phul.
Vern.—Hundro, pichari baha, S.
Wendlandia tinctoria, *DC.*; Rubiaceæ.
Vern.—Tilei, S.

Woodfordia floribunda, *Salisb; olim* Grislea tomentosa, *Roxb.*; Lythraceæ.

Local,—Dhaiphul, dhawei, dhowra, jaiphul.

Vern.—Ichak, S.

Wrightia tomentosa, *R. & S.*; Apocynaceæ.

Vern.—Atkura, buru machkunda, S.

Xylosma longifolium, *Clos.*; Bixineæ.

Xyris pauciflora, *Willd.*; Xyrideæ.

Yucca aloifolia; Liliaceæ. Cult. in gardens.

Adam's needle, E.

Zea Mays, *Linn.*; Gramineæ.

Local,—Măkai.

Vern.—Jondra, S; Jonar, B; Makai, H.

Zehneria Hookeriana, *Arn.*; Cucurbitaceæ.

Zehneria umbellata, *Thw.*; Cucurbitaceæ.

Vern.—At, S.

Zingiber capitatum, *Roxb.*; Scitamineæ. Jungla Adruk, *Roxb.*

Zingiber Casumunar, *Roxb.*; Scitamineæ.

Local,—Paro. Băn ada, H. & B. (*Roxb.*)

Zingiber officinale, *Rosc.*; Scitamineæ.

Local,—Ădrăk.

Vern.—Adraka, Ada, H. & B. The dry root, Soontha, *Roxb.*

(Zinnia, bidens *Roxb.*) Glosogyne pinnatifida, *DC.*; Compositæ.

Zinnia *species*; Compositæ.

Zizyphus Jujuba, *Lamk.*; Rhamneæ.

Local,—Baer.

Vern.—Dedlaori jomjanum, S. Common in gradens and self-sown.

Zizyphus Oenoplia, *Mill.*; Rhamneæ.

Local,—Koir.

Zizyphus oxyphylla, *Edgw*; Rhamneæ.

Vern.—Kurit rama, S.

Zizyphus rugosa, *Lamk.*; Rhamneæ.

Local,—Pithour.

Vern.—Sekra, S.

Zizyphus xylopyrus, *Willd.*; Rhamneæ.

Local,—Ghoot.

Vern.—Karkat, S; Karkata, K.

Zornia diphylla, *Pers.*; Leguminosæ.

Vern.—Tandi jhapni, bir moch, S.

III.—Systematic List of Chutia Nagpur Plants.(*)

I—RANUNCULACEÆ.

1. Clematis Gouriana *Roxb.*
   Parasnath.
2. Clematis nutans *Royle.*
   Baragaon, 2—3,000 feet: (also Parasnath, 2,000 feet, *Hooker*).
   Vern.—Bongo Khanti *Santal* (Campbell & Watt).
3. Thalictrum javanicum *Blume.*
   Neterhat, 300 feet *Gamble*; (also Parasnath, 4,000 feet, *Hooker*).
   (Aconitum heterophyllum *Wall.*)
   Bazars.
   Vern.—Atus-root. A bazar medicine (root only).

---

* In the preparation of his very valuable list of Chutia Nagpur plants, Lieutenant-Colonel Wood, as he has explained in a letter which accompanies it, has included not only every species observed or collected by himself, but every plant from the province collected by other botanists of which he has been able to see specimens or for which he has been able to find a record. In the case of one work in particular, Campbell and Watt's *Catalogue* of the plants of the Sontha Pergunnas—a very careful and reliable paper—he has cited the vernacular (Santali) names when such are given.

Finding from this letter that it was the author's desire to provide botanists with as complete a list as possible of Chutia Nagpur plants, the Editor has, in furtherance of this desire, attempt, to render it still more complete by including in the list *every* species obtained in Chutia Nagpur, of which there are, up to the time of going to press, any specimens in the Calcutta Herbarium.

It would not have been difficult in the case of not a few of these intercalated species to add vernacular names and economic notes like those given by the author of the list for species actually collected by him, Having regard, however, to the fact that such notes must have lacked the authority that accompanies the accurate economic references and the critical vernacular connotations made in the field by so careful and competent a Collector as Lieutenant-Colonel Wood, it has been deemed advisable only to intercalate the names of such species as are known to occur in Chutia Vagpur, although they have not been met with by Lieutenant-Colonel Wood; this, in fact, is what the author himself has done in the case of his own intercalations, except, as has already been explained, as regards the plants recorded by Campbell and Watt. As the list stands, therefore, it has the double advantage of giving as complete an enumeration as is yet possible of the plants of Chutia Nagpur, while leaving the painstaking and excellent work of the author with reference to the species collected by him untouched. In the few cases where plants collected by Lieutenant-Colonel Wood in Chutia Nagpur are not present in Herb., Calcutta, the fact is intimated in an editorial note within [ ] square brackets.—*Editor, Rec. Botanical Survey.*

II—DILLENIACEÆ.

4. Dillenia indica *Linn.*
   Santalia, say to 2,000 feet.
   Vern.—Korkot *Santal* (Campbell & Watt).

5. Dillenia pentagyna *Roxb.*
   Taimaraghat, Bundir, 1,500—2,000 feet; Dhadka, Manbhum, 500—1,000 feet.
   Vern.—Agor, Gulgul, Korkot.

III.—MAGNOLIACEÆ.

6. Michelia Champaca *Linn.*
   Stations in Chutia Nagpur, to 2,000 feet.
   Vern.—Chămpa. Cult. A bush in gardens; heavy jasmine odour; fls. yellow.

IV—ANONACEÆ.

7. Polyalthia longifolia *Benth. & Hook. f.*
   Dorunda, 1,500—2,000 feet.
   Vern.—Debdaru, Deodar *local.* Cult. as an avenue tree, say 30 feet. A light wood, used for splints, idols, etc. (*Herzog*).

8. Polyalthia cerasoides, *Benth & Hook. f.*
   Santalia, say to 2,000 feet.
   Vern.—Panjom *Santal.*—(Campbell & Watt).

9. Anona squamosa *Linn.*
   Ranchi, 2,000 feet.
   Vern.—Sarifa, Sariphal; Custard apple. Cult. in gardens.

10. Anona reticulata *Linn.*
    Ranchi, 200 feet.
    Vern.—Sarifa, Sariphal; Bullock's Heart. Cult. in gardens.

11. Saccopetalum tomentosum *H. f. & T.*
    Jaspurnagar, 2,000—2,500 feet; also Saidope reserve.
    Palamow (*Gamble*), say 2,000 feet.
    Vern.—Kari *local.* A tree 50 feet high; common.

12. Miliusa velutina *H. f. & T.*

V.—MENISPERMACEÆ.

13. Cocculus villosus *DC.*
    Kewtbar, Palamow, 1,000—1,500 feet.
    A common climber.

14. Cissampelos Pareira *Linn.*

Hopwa, Hazaribagh district, 1000—1,500 feet, (var. β. *H. f. & T.*); Jaspur State, 2,000—2,500 feet, (vars. α. & β.); Kotarki thana, Sirguja State, 1,500—2,000 feet, (vars. β. & δ.); Kochang, 2,000—2,500 feet, (vars. β. & δ.).

Climbing; in fruit (vars. β. & δ.), yellow or orange or green.

VI.—BERBERIDEÆ.

15. Berberis asiatica *Roxb*

Parasnath.

VII.—NYMPHÆACEÆ.

16. Nymphæa Lotus *Linn.*
17. Nymphæa stellata *Willd.*
18. Nelumbium speciosum *Willd.*

Common on tanks throughout Chutia Nagpur.

VIII.—PAPAVERACEÆ.

19. Argemone mexicana *Linn.*

Ranchi Plateau, 500—2,000 feet, common.

Vern.—Seyāl kanta=Jackal's tooth.

20. Papaver somniferum *Linn.*

In fields, cultivated for Opium under the Opium Department.

Vern.—Posta.

IX.—CRUCIFERÆ.

21. Nasturtium officinale *Br.*

Plains and Plateau 500—2,000 feet; cultivated water cress; "thrives well in Bengal." (*Firminger.*)

22. Nasturtium indicum *DC.*
23. Brassica oleracea *Linn.*,

Plains and Plateau.

Vern.—Band-kubi, Gol-kubi=Kohlrabi, Knolcole; Kubi=cabbage; Phul-kubi=cauliflower. Brusse's sprouts seen at Palamow. Cult. in Jail Garden, 1891.

24. Brassica nigra *Koch.*

Vern.—Sirsū. (Sinapis nigra, *Linn.*; S. erysimoides, *Roxb.*)

25. Brassica campestris *Linn.*

Sub. sp. 1 Campestris proper. Cultivated.

Vern.—Sŭlgŭm; Swedish Turnip.

Sub. sp. 2. Napus *Linn.* Cultivated.
Ranchi, 2,000 feet.
Vern.—Latni (Sinapis dichotoma *Roxb*). Indian Rape.
Sub. sp. 3. Rapa *Linn.* Cultivated.
Vern.—Sŭlgŭm; Common Turnip.
Sub. sp. 4. Sarson. Cultivated.
Vern.—Sirsū ; Indian Colza.
Two races with seed-pods erect (Natua) or pendent (ulti.) each with 2 sub-races 2-valved and 3-4-valved.
Erect 2-valved=Sinapis glauca, *Roxb.*; general.
Pendent 2-valved=Santalia only.
Erect 4-valved=Brassica quadrivalvis, *H. f. & T.*
"Banks of Soane opposite Rhotas" (*Hooker*).
Pendent 3-4-valved=Sinapis trilocularis, *Roxb.* Palamow (*Prain*).

26. Brassica juncea *H. f. & T.*
Vern.— Rai; Indian mustard.

27. Brassica, alba *H. f. & T.*
Ranchi, 2,000 feet.
Vern.—Sirsū (Sinapis alba *Linn.*)

28. Eruca sativa, *Lamk.*
Garden Rocket.

29. Cochlearia flava *Ham.*

30. Lepidium sativum *Linn.*
Vern.—Haleem *Hind;* Cress.

31. Raphanus sativus, *Linn.*
Very common; cultivated.
Vern.—Mūli. Radish of English gardens, globe or carrot shaped, small and Bazar or native mūli as large as carrots.

X.—CAPPARIDEÆ.

32. Cleome monophylla *Linn.*
Ranchi, 2,000 feet.

33. Cleome viscosa *Linn.*
Sillee, 500—1,000 feet.
Vern.—Ban Sirsu=Wild mustard; Jurutia.

34. Gynandropsis pentaphylla *DC.*
Jaspur, 2,000 feet.
Vern.—Guma. Astringent, flowers purple.

35. Capparis horrida *Linn. f.*
Chorea, Balmash, Dorunda, 1,500—2,000 feet.
Vern.—Bagni, Bagnei, Baguchi. Stem very thorny; fls. and stamens purple; fruit eaten as a vegetable.

XI.—VIOLACEÆ.

36. Ionidium suffruticosum *Ging.*
    Ranchi, 1,500—2,000 feet.
    Vern.—Suruj mukhi (*Watt*)? Surujmuli, (Chutia Nagpur).
37. Viola odorata *Linn.*
    Ranchi, Hazaribagh. Cult. in pots and gardens; fls. in cold weather.
38. Viola tricolor *Linn.*
    Ranchi, Hazaribagh. Cult. in pots and gardens; fls. in cold weather.

XII.—BIXINEÆ.

39. Cochlospermum Gossypium *DC.*
    Baragaon, 2,000—3,000 feet.
    Vern.—Sisibaha, Udal. Young leaves larger than adult ones.
40. Bixa Orellana *Linn.*
    Cult as a shrub in gardens.
    Vern.—Latkan, (*Watt*); Arnotto. The testa furnishes the common colour adulteration of milk and butter.
41. Flacourtia Ramontchi *L'Herit.*
    Tamar, 500—1,000 feet; Jaspur, 2,000—2,500 feet.
    Vern.—Sirle, Katai (*Jaspur*).
    Var. 2 sapida, *H. f. & T.*
    Jabra, 1,000—1,500 feet.
    Small brushrood, thorny (F. sapida *Roxb.*).
42. Xylosma longifolium *Clos.*
    Singhbhum, 500—1,000 feet, *Gamble, Haines.*

XIII.—POLYGALACEÆ.

43. Salomonia oblongifolia *DC.*
44. Polygala chinensis *Linn.*
    Santalia, 2,000 feet.
    Vern.—Gaighura *Santal.* (Campbell & Watt.)
45. Polygala triphylla *Ham.* *Var.* glaucescens *H. f. & T.*
46. Polygala crotalarioides *Ham.*
    Santalia, 2,000 feet.
    Vern.—Lil Kathi *Santal.* (Campbell & Watt.)
47. Polygala erioptera *DC.*
    Santalia, 2,000 feet.
48. Polygala leptalea *DC.*

XIV.—CARYOPHYLLEÆ.

49. Saponaria Vaccaria *Linn.*
"Cult. An oilseed" (*Campbell* & *Watt*); "A weed of cultivation. Throughout India" (*F. B. I.*).
Vern.—Musna *Santal* (Campbell & Watt.)
50. Spergula arvensis *Linn.*
51. Spergula pentandra *Linn.*
52. Polycarphæ corymbosa *Lamk. var.* aurea *Wight.*
Baragaon 2,000—3,000 feet; in fields. A weed.
Vern.—Janhe Nanjom *Santal* (Campbell & Watt).
53. Polycarpa Lœflingiæ *Bth.* & *Hook. f.*
54. Drymaria cordata *Willd.*

XV.—PORTULACEÆ.

55. Portulaca oleracea *Linn.*
Santalia.
Vern.—Mota seric (? uric) alang *Santal.* (Campbell & Watt.)
56. Portulaca quadrifida *Linn.*
57. Portulaca tuberosa *Roxb.*
So far only known from Monghyr.
[Watt refers to a *Portulaca* sp.—a troublesome weed; ¼—½ inch. Fls. pale purple.]

XVI.—TAMARISCINEÆ.

58. Tamarix ericoides *Rottb.*
Jilmili river, Sirguja, 1,500—2,000 feet.
Vern.—Jao; low. Common in river-beds; a bush-like broom.

XVII.—ELANTIEÆ.

59. Bergia ammannioides *Roxb.*

XVIII.—HYPERICINEÆ.

60. Hypericum japonicum *Thunb.*

XIX.—GUTTIFERÆ.

61. Garcinia Cowa *Roxb.*
Singbhum.
62. Mesua ferrea *Linn.*
Planted only.

XX.—TERNSTROEMIACEÆ.

63. Camellia theifera *Griff.*
Cultivated at 1,500—2,000 feet, *e.g.*, at Sitagarha (Hazaribagh) and Palandu (Ranchi) the oldest Tea-Estates in Chutia Nagpur.
Vern.—Cha *Hind.* Tea. In flower Novr. Probably a hybrid, Chinese and Assam, or the China Plant.

XXI.—DIPTEROCARPEÆ.

64. Shorea robusta *Gaertn. f.*
Sillee, 300—1,000 feet and elsewhere.
Vern.—Chal-Sal, Săkua, Sarjom *Kol* (? *Mandari*); hence "Sarjom dip"=village of the Sal tree. Sal forests young and old, common throughout Chutia Nagpur. Difficult to grow from seed (*T. Peppé*) and hence not *laid down.* Timber used for all purposes; sinks in water and is floated on bamboo rafts (down the Kol river, *e.g.*, in Palamow) in the rains. A *red* wood freely attacked by white ants.

XXII—MALVACEÆ.

65. Althaea rosea *Willd.*
Cult. in gardens.
Vern.—Gool khaira. Hollyhock.
66. Sida mysorensis *Willd.*
67. Sida carpinifolia *Linn.*
68. Sida cordifolia *Linn.*
69. Sida rhombifolia *Linn.*
70. Sida humilis *Willd.*
Ranchi, 1,500—2,000 feet; a common weed.
Vern.—Bir-bariar, Tandi-bariar, Bariar, Jokha, Sakam.
Sida spinosa *Linn.*
71. Abutilon indicum *G. Don.*
Ranchi, 1,500—2,000 feet; Jilmili, Sirguja 1,000—1,500, feet.
Vern.—Miru baha *Santal.* By jungle sides; orange yellow flowers.
72. Abutilon polyandrum *Schlecht.*
73. Pavonia odorata *Willd.*
74. Urena sinuata *Linn.*
Jaspurnagar, 2,000—2,500 feet.
Vern.—Beri lăt (1).

75. Urena repanda *Roxb.*
    Jonha, 1,000—1,500 feet; Sirguja, 1,500—2,000 feet; sometimes six feet high.
76. Urena lobata *Linn.*
    Santalia.
    Vern.—Bidhi janetet *Santal.*
77. Hibiscus micranthus *Linn.*
78. Hibiscus panduræformis *Burm.*
79. Hibiscus furcatus *Roxb.*
    Pitorea, 2,000—2,500 feet.
80. Hibiscus vitifolius *Linn.*
81. Hibiscus cancellatus *Roxb.*
    Ashpur, 2,000—2,500 feet; Keonjhur, 1,500—2,000 feet.
    Vern.—Bera Kănda. Kulkudari. Root eaten. Poulticea head. About hill-side woods.
82. Hibiscus mutabilis *Linn.*
83. Hibiscus rosa-sinensis *Linn.*
    Palandu, etc.; in gardens, cultivated. Shoe-flower; native of China.
84. Hibiscus Sabdariffa *Linn.*
    All stations, 500—2,000 feet.
    Vern.—Arak kudrum *Santal*; Patwa. Calyces make jelly, best red-currant jelly.
85. Hibiscus cannabinus *Linn.*
    Santalia.
    Vern.—Dare kudrum *Santal.*
86. Hibiscus esculentus *Linn.*
87. Thespesia Lampas *Dalz & Gibs.*
    Jaspur, 2,000—2,500 feet.
    Vern.—Băn Kăpas; wild cotton. In fruit in Novr.
88. Gossypium herbaceum *Linn.*
    Ranchi, 1,500—2,000 feet; Cult in fields.
    Vern.—Kăpas; Cootton. Hand-manufactured, thread and cloth, locally.
89. Kydia calycina *Roxb.*
    Sillee, 500—1,000 feet; Gunia 1,500—2,000 feet; Sitonga, Jaspur, 2,000—2,500 feet; Dorunda 1,500—2,000 feet.
    Vern.—Lengra Dhamin (*Peppé*); Bichra (1).
    A shrub, 15 feet, used for "Banghy-sticks." (Bichra (2) is Grewia salvifolia *Heyne*).
90. Bombax malabaricum *Linn.*
    General, 500—3,000 feet.
    Vern.—Simăl; Simăr; Silk-Cotton tree. Height up to 120 feet; Timber not good—loose.

XXIII.—STERCULIACEÆ.

91. Sterculia urens *Roxb.*

Tamar, 500—1,000 feet; Singbhum, 500—1,000 feet; Patratu.

Vern.—Māk chūnd; Gur-karanj, *Mundari*; Tele, *Ho*; Būr Kūnda, *Mundari.*

Causes intolerable itching if touched or handled; oil removes the hairs, and the itching, effectually.

(Another Māk chūnd is Pterospermum acerifolium, *Willd.*)

92. Sterculia colorata *Roxb.*

Tamar, 500—1,000 feet; Palandu, perhaps planted.

93. Helicteres Isora *Linn.*

94. Pterospermum acerifolium *Lamk.*

Chutia Village, near Ranchi, 1,500—2,000 feet.

Vern.—Māk chūn. (Sterculia urens *Roxb.* is also a Māk chūnd.)

95. Eriolæna Hookeriana *W. & A.*

Palamow, Kumandi Reserve Forest, say 1,000 feet; Sirguja, 1,500—2,000 feet, not uncommon.

Vern—Chota Changoor; Wawas; Kusu (? Kuru); (Campbel & Watt): Denri (Sirguja). Bark fibrous.

96. Eriolæna quinquelocularis *Wight.*

Jaspur, 1,500—2,000 feet.

Vern—Bhăwăt.—Poultice of root heals wounds.

97. Pentapetes phœnicea *Linn.*

Santalia.

Vern.—Bare baha, *Santal*.

98. Melochia corchorifolia *Linn.*

Santalia, about 2,000 feet.

Vern.—Thuiak arak, *Santal.*

99. Waltheria indica *Linn.*

100. Buettneria herbacea *Roxb.*

Santalia, about 2,000 feet.

Vern.—Diku; Sindur; Kambraj, *Santal.*

XXIV.—TILIACEÆ.

101. Grewia salvifolia *Heyne,*

Sirguja, 1,500—2,000 feet; Jaspur, 2,000—2,500 feet.

Vern.—Pardawan, Bichra (Sirguja).

102. Grewia scabrophylla *Roxb.*

103. Grewia tiliæfolia *Vahl.*

Baragaon, 2,000—2,500 feet.

Vern.—Benga daru. "Banghy sticks" made of the wood.

104. Grewia excelsa *Vahl.*
105. Grewia asiatica *Linn.*
Ranchi, 1,500—2,000 feet, perhaps cult.; Dorunda garden, 1,500—2,000 feet, cult.
Fruit 2-stoned, edible; bark fibrous.
106. Grewia sapida *Roxb.*
107. Grewia pilosa *Lamk.*
Sirguja and Kuru ghat, Chandwa, 1,500—2,000 feet.
Vern.—Gur-Sikri. Fruit green or orange; bark fibrous.
108. Grewia hirsuta *Vahl.*
109. Grewia laevigata *Vahl.*
Jonha to Sandunandi. 1,000—1,500 feet.
110. Grewia vestita *Wall.*
111. Grewia cinnamomea *Gamble.*
112. Triumfetta rhomboidea *Jacq.*
Jaspur, 2,000—2,500 feet, common.
Vern.—Bēri lăt.
113. Corchorus fascicularis *Lamk.*
114. Corchorus acutangulus *Linn.*
115. Corchorus olitorius *Linn.*
Ranchi, 1,500—2,000 feet.
Vern.—Băn pāt.
(Campbell and Watt mention a *Corchorus* n. sp.)
Vern.—Bir Narcha *Santal.*, leaves used as a potherb.
116. Elæocarpus serratus *Linn.*
Dorunda garden 1,500—2,000 feet.
Vern.—Jălpai; Indian Olive. Tree 40—50 feet; flowers white.

XXV—LINEÆ.

117. Linum usitatissimum *Linn.*
Cult. in fields everywhere to 2,500 feet.
Vern. Tisi.
(Crimson and scarlet-flowered species, also cult. in gardens.)
118. Reinwardtia trigyna *Planch.*
Pitorea and Jaspur, 2,000—2,500 feet.
Vern.—Lŭngora. Flowers bright chrome-yellow.
119. Erythroxylon Coca *Lamk.*
Daladiri Tea Estate, also in Ranchi gardens.
Difficult to raise from seeds; none have germinated but self-sown plants rise (*Peppé*).

XXVI.—MALPIGHIACEÆ.

120. Hiptage Madablota *Gaertn.*

XXVII.—ZYGOPHYLLEÆ.

121. Tribulus terrestris *Linn.*

XXVIII.—GERANIACEÆ.

122. Geranium ocellatum *Camb.*
Santalia 1,500—2,000 feet (Campbell & Watt).
[This occurs on Parasnath, near the top of the mountain.]

123. Oxalis corniculata *Linn.*
Pitorea and Jaspur, 2,000—2,500 feet.
Vern.—Barangi (Jaspur). Flowers yellow.

124. Biophytum sensitivum *DC.*
Mahretta Tea Estate 2,000 feet.
A sensitive plant, growing in shade; flowers yellow.

125. Biophytum Reinwardtii *Walp.*
Chakardarpur, Singbhum, 500 feet.
Vern.—Tetria.

126. Averrhoa Carambola *Linn.*
Cult. in gardens, Dorunda 1,500—2,000 feet.
Vern.—Kamaránga. A small tree, the sour variety; fruit three inches long, used for pickles, jam, ect.

127. Impatiens Balsamina *Linn.*
Cult. single and double, also a garden weed (and an escape) in Chutia Nagpur.
Garden Balsam.

XXIX.—RUTACEÆ.

128. Glycosmis pentaphylla *Corr.*

129. Micromelum pubescens *Bl.*
Baragaon, 2,000—3000 feet.
Vern.—Exsirha.

130. Limonia acidissima *Linn.*

131. Murraya exotica *Linn.*

132. Murraya Kœnigii *Spreng.*

133. Aegle Marmelos *Correa.*
Baragaon, 2,000—3,000 feet.
Vern.—Bēl; Lohagasi, *Kol;* Siphul (*Watt*). Bael. A very common tree, scattered specimens in jungle or near villages; also cult.
Mach used in sherbets; a reputed cure for Dysentery.

134. Feronia Elephantum *Corr.*
135. Citrus medica *Linn.*
136. Citrus aurantium *Linn.*
137. Citrus decumana *Murr.*

The three foregoing, respectively the Lime, *Vern.*—Limbu, Nimbu; the orange, naringi; and the Pŏmelo or Shaddock, are cultivated in gardens, native and European.

XXX.—SIMARUBEÆ.

138. Ailanthus excelsa *Roxb.*

Satbarua Fort, 1,000—1,500 feet.

Vern—Gur Karanj. A moderate sized tree.

XXXI.—OCHNACEÆ.

139. Ochna pumila *Ham.*

XXXII.—BURSERACEÆ.

140. Boswellia serrata *Roxb.*

Sirguja, 1,500—2,000 feet.

Vern.—Sălái, Sálly; Lŭban=the gum: Olibanum. A common tree, 50—60 feet high; boughs used as fences take root; orange-leaved when withering; charcoal (*vide Lillingstone*) good for gunpowder.

141. Garuga pinnata *Roxb.*

Jaspur, 1,500—2,000 feet; Sirguja.

Vern.—Bŭna gingeri; ken-kur. A tree, 40 feet high; bark of young branches used as astringent.

142. Bursera serrata *Roxb.*

XXXIII.—MELIACEÆ.

143. Melia Azadirachta *Linn.*

Ranchi, 1,500—2,000 feet.

Vern.—Nīm, *Hind;* Nimi, *Kol.* Poultices made of leaves.

144. Melia Azedarach *Linn.*

Sillee, 500—1,000 feet; Dorunda, 1,500—2,000 feet: Chyebassa, 500—1,000 feet; Cult. by roadsides and in compounds.

Vern.—Belāti Bākain. Persian Lilac. Flowers purple; timber bad; tree soon decays. A variegated specimen, white and green-leafed, observed by the large tank at Chyebassa.

145. Cipadessa fruticosa *Bl.*

146. Aglaia Roxburghiana *W. & A.*
Pitorea, 2,000—2,500 feet.
Leaves with ferruginous stellate scales.

147. Amoora Rohituka *W. & A.*

148. Heynea trijuga *Roxb.*
Baragaon, 2,000—3,000 feet.
Vern.—Băn-Sīmar, meaning "wild silk-cotton tree." A large climber! given as "a tree" (*Roxburgh*). "sometimes attaining a large size" (*Hiern* in *F. B. I.*).

149. Soymida febrifuga *A. Juss.*
Chandwa, Toree 1,000—1,500 feet;
Tatupani, Sirguja, 1,400—2,000 feet; abundant on Chandwa-Balumath road.
Vern.—Róhina. A tree; ripe fruits adherent as in *Terminalia tomentosa* (Ăsăn) but with open valves.

150. Cedrela Toona *Roxb.*
Palandu, etc., 1,500—2,000 feet; common and cult.
Vern.—Tūn, Tūni; Bastard Mahogany. Useful timber for furniture, tea-boxes, etc.

XXXIV.—OLACINEÆ.

151. Olax scandens *Roxb.*
Jabra, 1,000—1,500 feet; Hundgunge, Baragaon, 2,000—3,000 feet.
Vern.—Gūti băn. In fruit in December.

XXXV.—CELASTRINEÆ.

152. Gymnosporia montana *Roxb.*

153. Celastrus paniculata *Willd.*
Ranchi 1,500—2,000 feet; Jaspur 1,500—2,000 feet; Sirguja, 1,500—2,000 feet; Kochang, 2,000—2,500 feet.
Vern.—Kūjīri, Kudj'ri. A bush or climber.

154. Elæodendron glaucum *Pers.*
Hilghat, Jaspur, 1,500—2,000 feet.
Vern.—Ratan gowra. A tree; root purgative; leaves good for fever.

XXXVI.—RHAMNEÆ.

155. Ventilago calyculata *Tul.*
Ranchi, to 2,000 feet; Jaspur 2,000—2,500 feet.
Vern.—Sākān. A climber, very common in jungle.

156. Zizyphus Jujuba *Lamk.*
Palamow, 1,000—1,500 feet; common,
Vern.—Baer (pronounced Buyer). A bush-like gorse or whin; fruit eaten.

157. Zizyphus vulgaris *Lamk.*
Santalia.
Vern.—Kurit rama *Santal.* (Campbell & Watt.)

158. Zizyphus Œnoplia *Mill.*
Pitorea, 2,000—2,500 feet; Sirguja, 1,500—2,000 feet.
Vern.—Koir (*Mundari*?). A climber; fruit eaten.

159. Zizyphus xylopyra *Willd.*
Baragaon, 2,000—3,000 feet; Jaspur, 1,500—2,000 feet; Chutupālu, 1,500—2,000 feet.
Vern.—Ghoot (Jaspur).

160. Zizyphus rugosa *Lamk.*
Lohardugga District, 1,500—2,000 feet; Jaspur, 2,000—2,500 feet.
Vern.—Pit-hower. Fruit eaten.

161. Gouania leptostachya *DC.*
Sonua, Kolhan, Singbhum, 500—1,000 feet, *Gamble*; Sitonga, Jaspur, 2,000—2,500 feet.
Vern.—Pahar-ka-dudhi. A climber.

162. Helinus lanceolatus *Brand.*

XXXVII.—AMPELIDEÆ.

163. Vitis adnata *Wall.*
Santalia.
Vern.—Bod lar nari *Santal.* (Campbell & Watt.)

164. Vitis tomentosa *Heyne.*
Sirguja, Pertabpur, 1,500—2,000 feet.
Vern.—Ghora lidi, (Campbell & Watt.)

165. Vitis lanata *Roxb.*
Santalia.
Vern. Kolo nari *Santal.* (Campbell & Watt.)

166. Vitis lanceolaria *Roxb.*

167. Vitis latifolia *Roxb.*

Chutu pālu ghat, 1,500—2,000 feet.
Fruit eaten; seeds large; flavour good.

168. Vitis vinifera *Linn.*

Dorunda, 1,500—2,000 feet: Cult.
Vern.—(fruit) Ăngūr; Grape-vine. Fruit fails to ripen because of the rains.

169. Vitis auriculata *Roxb.*

Mata, Manbhum, 500—1,000 feet.
Vern.—Korkóta.

170. Leea alata *Edgew.*

171. Leea macrophylla *Roxb.*

Santalia, say 500—2,000 feet.
Vern.—Hatkan *Santal.* "A rare plant, like *L. robusta*" (Campbell & Watt).

172. Leea robusta *Roxb.*

173. Leea aspera *Hall.*

Jaspur, 2,000—2,500 feet;
Common in jungle.
Vern.—Hasua dahuri; Hernua dowri; Akori. *A Sāg*, leaves eaten; root sweet-scented.

174. Leea herbacea *Ham.*

175. Leea sambucina *Willd.*

Santalia (Campbell & Watt).

176. Ampelopsis quinquefolia *Michx.* (=Vitis hederacea *Ehsh*).

In gardens; an American plant.

XXXVIII.—SAPINDACEÆ.

177. Cardiospermum Halicacabum *Linn.*

Sillee, 500—1,000 feet; Sirguja, 1,500—2,000 feet.
Vern.—Gæphuli *local.*

178. Schleichera trijuga *Willd.*

Baragaon, 2,000—2,500 feet, S. Lohardugga District, 1,500—2,000 feet; Palandu, 1,500—2,000 feet.
Vern.—Kūsūm (2) *Hind.*; Baru *Santal.* The Lac-insect is cultivated on the twigs of this tree. The other Kūsūm (*Hind.*) is *Carthamus tinctorius.*

179. Sapindus trifoliatus *Linn.*
Hazaribagh district, village Chatra, 1,500—2,000 feet.
Vern.—Phalanda. A tree, about 20 feet high, by the roadside,? planted. Appearance suggested *Mallotus philippinensis* but has green, not red fruit: only this one tree ever seen.

180. Sapindus Mukorossi *Gaertn.*
Jaspurnagar, 2,000—2,500 feet; cult. in the Rajah's garden.
Vern.—Reti or Rēthi. A tree, up to 40 feet; "pulp of fruit used to wash linen" (*Roxburgh*).

181. Nephelium Litchi *Camb.*
Dorunda and Ranchi, 1,500—2,000 feet; cult. but sparsely.
Vern.—Līchī; the Litchi of Commerce. The fruit ripens well.

182. Dodonæa viscosa *Linn.*
Palandu, 1,500—2,000 feet; cult.
As evergreen hedges in gardens. Dodonia *Eng.*

XXXIX.—ANACARDIACEÆ.

183. Mangifera indica *Linn.*
Dorunda. 1,500—2,000 feet; Cult. for the fruit.
Vern.—Ām, Ul. The Mango. A source of food; kernels also eaten raw or cooked.

184. Buchanania latifolia *Roxb.*
Sillee, 500—1,000 feet.
Vern.—Piál, Piār. One of the commonest scrub jungle bushes.

185. Odina Wodier *Roxb.*
Common.
Vern.—Doka *Santal.*

186. Semecarpus Anacardium *Linn.*
Sillee, 500–1,000 feet.
Vern.—Belwa, Soso. Mouths of children seem ulcerated from eating the fruit, part of which is acid and part harmless. The juice of the *tree* is acrid.

187. Spondias mangifera *Willd.*
Ranchi, 1,500—2,000 feet.
The "Amra, Hog-plum" (*F. B. I.*).

XL.—MORINGEÆ.

188. Moringa pterygosperma *Gaertn.*
Cultivated, *e.g.*, as a tree in villages, common.
The Horse-radish tree; "root pungent" (*F. B. I.*).

XLI.—LEGUMINOSÆ.

189. Heylandia latebrosa *DC.*
190. Crotalaria prostrata *Roxb.*
    Jaspur, 2,000—2,500 feet.
    Vern.—Jinjŭnia.
191. Crotalaria sericea *Retz.*
192. Crotalaria alata *Ham.*
    Santalia.
    Vern.—Mărăng jhunka *Santal* (Campbell & Watt).
193. Crotalaria mysorensis *Benth.*
194. Crotalaria albida *Heyne.*
    Sitonga, Jaspur, 2,000—2,500 feet; Chectiari Bărwa, 2,000—3,000 feet; Lohardugga village, Palamow, 1,500—2,000 feet; Sirguja, 2,000 feet.
    Vern.—Ban methi. Root purgative; fls. yellow.
    (Methi is *Trigonella Foenum-græcum.*)
195. Crotalaria linifolia *Linn.*
196. Crotalaria calycina *Schrank.*
    Mahretta Tea Garden, 2,000—2,500 feet.
197. Crotalaria juncea *Linn.*
    Sillee, Jonha jungles, 1,000—1,500 feet.
    Vern.—Sŭn. Fishing-net fibre got from this plant.
198. Crotalaria medicaginea *DC. Var.* neglecta.
199. Crotalaria striata *DC.*
    Dorunda, 1,500—2,000 feet.
    A garden aud road-side weed.
200. Chotalaria quinquefolia *Linn.*
201. Trigonella Foenom-græcum *Linn.*
    Cult.
    Vern.—Methi; Fenugreek. In Sikkim women use it as a hair-brush.
202. Indigofera linifolia *Retz.*
    Sillee, 500—1,000 feet; Jabra, Hazaribagh, 1,000—1,500 feet; Manka, Palamow, 1,000—1,500 feet; common on cultivated and waste land.
    Vern.—Suruj muli. Flowers bright crimson.
203. Indigofera echinata *Willd.*
204. Indigofera enneaphylla *Linn.*
205. Indigofera tinctoria *Linn.*
    Manbhum District, 500 feet; cult. in fields for dye-manufacture.
    Vern.—Nil, Lil.

206. Indigofera pentaphylla *Linn.*
207. Indigofera pulchella *Roxb.*

Barwa plateau, Lohardugga District, 2,500—3,000 feet; S. Palamow, 2,500—3,000 feet; commonly road sides in the ghats.

Vern.—Jerool, Jeroolphúl. A shrub, flowers pink.

208. Indigofera trifoliata *Linn.*
209. Indigofera trita *Linn. f.*
210. Indigofera hirsuta *Linn.*
211. Indigofera cordifolia *Heyne.*
212. Psoralea corylifolia *Linn.*

Satbarua, Palamaw, 1,000—1,500 feet.

213. Cyamopsis psoraloides *DC.*
214. Millettia auriculata *Bak.*

Pitorea, 2,000—2,500 feet; Baragoon, 2,000—2,500 feet.
Vern.—Băn Simăr; Hehel *Santal.* A large climber.

215. Tephrosia purpurea *Pers.*

Sillee, 500—1,000 feet; common on waste land.
Vern.—Sărpănk.

216. Sesbania ægyptiaca *Pers.*

Ranchi, 1,500—2,000 feet.

217. Sesbania aculeata *Pers.*

Jonha, 1,000—1,500 feet.

218. Zornia diphylla *Pers.* *Var.* zeylonensis *Bak.*

Uparghat, Jaspur, 2,000—2,500 feet; on rocky knolls.
Vern.—Tandijhapni; Bir moch *Santal.*

219. Smithia conferta *Linn.*
220. Smithia ciliata *Royle.*
221. Smithia sensitiva *Ait.*

Sirguja, 1,500—2,000 feet; near water-courses in the open.
Vern,—Kijuli *local.* Flowers yellow.

222. Æschynomene indica *Linn.*
223. Æschynomene aspera *Linn.*
224. Leptodesmia congesta *Benth.*

Jaspur, 2,000—2,500 feet.
Vern.—Sunia. A small trefoil.
[Not in Herb., Calcutta, from Chutia Nagpur.]

225. Uraria hamosa *Wall.*
226. Uraria lagopoides *DC.*

Betghat, Jaspur, 1,500—2,000 feet.
Vern.—Mahadeo Jăt.

227. Uraria alopecuroides *Wight.*
Jabra, Hazaribagh, 1,000—1,500 feet; in jungles, common.

228. Alysicarpus vaginalis *DC.* *Var.* nummularifolius *Bak.*
Jaspur, 2,000—2,500 feet.
Vern.—Angūl.

229. Alysicarpus monilifer *Edgew.*

230. Alysicarpus rugosus *DC.*
Tundi Hills (Campbell & Watt).

231. Alysicarpus bupleurifolius *DC.*

232. Ougeinia dalbegioides *Benth.*
Guina village, Toree, Lohardugga, 500—1,000 feet; Munka, Palamow, 500—1,000 feet.
Vern.—Pănăn.

233 Arachis hypogaea *Linn.*
Daladiri and Bankuli Tea Estates, 1,500—2,000 feet; cult.
Vern.—Chīné bădām.

234. Desmodium Cephalotes *Wall.*
Pitorea, 2,000—2,500 feet. Shrub, 8—10 feet high.

235. Desmodium pulchellum *Benth.*
Mahretta Tea garden, Hazaribagh, 2,000—2,500 feet; Pitorea, 2,000—2,500 feet; Jaspur, 2,000—2,500 feet; Kochang, S. of Lohardugga dist., 2,000—2,500 feet; common.
Vern.—Paikh.

236. Desmodium gangeticum *DC.*
Jaspur, 2,000—2,500 feet; Dorunda 1,500—2,500 feet.
Vern.—Nakial, Nakiel.

237. Desmodium latifolium *DC.*
Pitorea, 2,000—2,500 feet.

238. Desmodium diffusum *DC.*

239. Desmodium polycarpum *DC.*
Sitonga, Jaspur, 2,000—2,500 feet; Sirguja, 1,500—2,000 feet.
Vern.—Karjani; Brahmini; Karanji (Sirguja).

240. Desmodium brachystachyum *Grah.*

241. Desmodium laxiflorum *DC.*

242. Desmodium triflorum *DC.*
Jaspur, 2,000—2,500 feet; Ranchi, 1,500—2,000 feet.
Vern.—Sunia. A small trefoil.

243. Desmodium parvifolium *DC.*
Jaspur, 2,000—2,500 feet; Santalia.
Vern.—Ămăt Chingar.

244. Desmodium gyrans *DC.*
Tamar, 500—1,000 feet; Toree, 1,500—2,000 feet; Sirguja, in shady nullahs, 2,000 feet.

245. Desmodium gyrans *DC. Var.* Roylei.
Tamar, 500—1,000 feet.

245A. Lespedeza sericea *Miq.*

246. Arbus precatorius—*Linn.*
Baragaon, 2,000—2,500 feet.
Vern.—Karjani, Rati (the seeds).

247. Cicer arietinum *Linn.*
Cult. everywhere in fields.
Vern.—Bŭt; Cheuna, *local.* Horses fed chiefly on this in Chutia Nagpur.

248. Lathyrus Aphaca *Linn.*
Kewtbar, Palamow, 1,000—1,500; cult., *a field of it.*
Vern.—"Chuna" (Piddington); "Musōōr-Chuna" (*Roxburgh.*) (*Not* Chūnna Chenna (local), which is *Cicer arietinum.*)

249. Lathyrus sativus *Linn.*
Barwa plateau, 2,500—3,000 feet.
Vern.—Kisāri; Kisāri-dall (*Forbes*). Mortification said to follow its too frequent use, more particularly when eaten raw; some natives of Chutia Nagpur limit its use to once a week. I like it *well.* (J. J. W.)

250. Pisum sativum *Linn.*
All Stations, 500—2,000 feet.
Vern.—Mătăr, *local.*

251. Pisum arvense *Linn.*
Cult. in fields, common.
Vern.—Chota mătăr, *local.*

252. Vicia Faba *Linn.*
Cult.
Vern.—Sem; Broad bean.

253. Vicia hirsuta *Koch.*
Santalia.
Vern.—Tiririti *Santal.*

254. Dumasia villosa *DC.*

255. Glycine hispida *Maxim.*
Santalia.
Vern.—Ram Kurthi, *Hind., local*; Hindi desom horec, *Santal.*

256. Teramnus labialis *Spreng.*

257. Mucuna pruriens *DC.*
Ranchi, 1,600—2,000 feet.

Vern.—Khujli.

258. Mucuna utilis *Wall.*

259. Mucuna nivea *DC.*

Cult. Flowers white, velvet of pod said not to be irritant.

260. Erythrina indica *Roxb.*

Ranchi, 2,000 feet; planted.

261. Erythrina suberosa *Roxb.*

262. Erythrina resupinata *Roxb.*

263. Spatholobus Roxburghii *Benth.*

Pitorea, East Hill, 2,000—2,500 feet.

Jaspur, 1,500—2,000 feet.

Vern.—Chundan, Bendo (1) (*Jaspur*). In sal jungle.

264. Butea frondosa *Roxb.*

Palandu, 1,500—2,000 feet.

Sirguja, 1,500—2,000 feet.

Vern.—Pharad; also Palás, Paras, Dhak, *Beng.*; Murut.

265. Butea superba *Roxb.*

Ghats.

266. Canavalia ensiformis *DC.*

Ranchi, 1,500—2,000 feet.

Var.—3. Mollis *Wall.*

Dorunda garden and Ranchi, 1,000—2,000 feet.

267. Canavalia virosa *W. & A.*

268. Pueraria tuberosa *DC.*

Jaspur, 2,000—2,500 feet.

Vern.—Bendo (2). Ropes made of fibre.

269. Goona Grahami *Benth.*

270. Phaseolus aconitifolius *Jacq.*

Santalia, about 2,000 feet.

Vern.—Bir moch, Bir mung, Moch, *Santal*; Moth, *Hind.*

271. Phaseolus Mungo *Linn.*

Chyebassa, 500—1,000 feet.

Cult. a pulse.

Vern.—Mūng, Mūng-dall. Seeds green, a variety.

272. Phaseolus calcaratus *Roxb.*

Santalia.

Vern.—Sutri *Santal.*

273. Phaseolus trilobus *Ait.*

274. Phaseolus vulgaris *Linn.*

All Stations, 500—2,000 feet;

Cult.

Paras bean; Haricot bean; French bean

275. Vigna Catjang *Endl.*

Vern.—Burbuti (*Roxburgh*); serwang *Santal*; Bēr ghangra (the fruit) *Santal.*

276. Vigna vexillata *Benth.*

277. Pachyrhizus angulatus *Rich.*

278. Clitoria ternatea *Linn.*

All Stations, 500—2,000 feet.

Mussel-shell creeper.

279. Dolichos Lablab *Linn.*

280. Dolichos biflorus *Linn.*

Lohardugga dist., 1,500—2,000 feet.

A pulse, cult. in fields.

Vern.—Kūrti; koolthee (*Roxburgh*).

281. Atylosia crassa *Prain.*

Sillee, 500—1,000 feet; Sirguja, 1,500—2,000 feet.

Vern.—Ram Kūrti.

282. Atylosia platycarpa *Benth.*

283. Atylosia scarabæoides *Benth.*

Sillee, 500—1,000 feet; Jaspur, 2,000—2,500 feet; Sitonga, Loro, Jaspur, 2,000 feet.

Vern.—Băn Kūrti. In Jaspur termed Ram Kūrti but probably a mistake for Băn Kūrti.

284. Cajanus indicus *Spreng.—var.* bicolor.

Ranchi, 1,500—2,000 feet; cult., cold-weather pulse.

Vern.—Ráhăr; Ărhăr; Ráhăr-dall; Ărhăr-dall.

285. Rhynchosia minima *DC. var* laxiflora.

286. Eriosema chinense *Vog.*

287. Flemingia semialata *Roxb.*

288. Flemingia nana *Roxb.*

289. Flemingia bracteata *Roxb.*

290. Flemingia strobilifera *R. Br.*

Ranchi, 1,500—2,000 feet.

291. Flemingia paniculata *Wall.*

292. Flemingia Chappar *Ham.*

Jabra, Hazaribagh 1,000—1,500 feet. A low shrub, common in jungles.

293. Flemingia stricta *Roxb.*

Ranchi, 1,500—2,000 feet.

294. Dalbergia Sissoo *Roxb.*

Vern.—Sisū, Shēshăm. A common timber.

295. Dalbergia latifolia *Roxb.*
Tirla nadi, Lohardugga, 2,000—2,500 feet.
Vern.—Păndăn.

296. Dalbergia lanceolaria *Linn.*
Sitonga, Jaspur, 2,000—2,500 feet; S. Dāmuda Ghat, *Gamble.*
Vern.—Băn Mūnga.

297. Dalbergia volubilis *Roxb.*
Tirla nadi, Lohardugga, 2,000—2,500 ft. Fls. white.

298. Pterocarpus Marsupium *Roxb.*
Tataparu, Sirguja, 1,500—2,000 feet.
Vern.—Beăl.

299. Pongamia glabra *Vent.*
Ranchi; Palandu, 1,500—2,000 feet.
Vern.—Kărănj. Planted as village avenues.
An oil bean; oil smoky, cleared with salt, much used for burning.

300. Derris scandens *Benth.*

301. Sophora Bakeri *Clark.*
Top of Parasnath.

302. Cæsalpinia Bonducella *Flem.*

303. Cæsalpinia Sappan *Linn.*
Ranchi; Hazaribagh; planted.

304. Cæsalpinia pulcherrima *Sw.*
All stations in Chutia Nagpur; in hedges, etc.

305. Cæsalpinia sepiaria *Roxb.*

306. Cæsalpinia digyna *Rottb.*

307. Cæsalpinia coriaria *Kunth.*
Chyebassa. 500—1,000 feet; native of S. America, cult.

308. Mezoneuron cucullatum *W. & A.*

309. Poinciana regia *Boj.*
In stations, *e.g.*, Ranchi, Dorunda, Hazaribagh.
The Mascarene Flamboyant, or Gold Mohur Tree.

310. Parkinsonia aculeata *Linn.*
Barli, Grand Trunk Road, 1,500—2,000 feet; Chyebassa, 500—1,000 feet; universally cult., and often naturalized.

311. Cassia Fistula *Linn.*
Ranchi; Dorunda; 1,500—2,000 feet; planted.
Vern.—Āmultăs; Băndăr-lathi.

312. Cassia Sophera *Linn.*

313. Cassia obtusifolia *Linn.*

314. Cassia Tora *Linn.*
Ranchi, 1,500—2,000 feet; very common in waste ground.

315. Cassia glauca *Lamk.*; *var.* suffruticosa *Kœnig.*
Ranchi, 1,500—2,000 feet.

316. Cassia Absus *Linn.*

317. Cassia pumila *Lamk.*

318. Cassia mimosoides *Linn.*
Tamar, 500—1,000 feet; Jaspur, 1,500—2,000 feet; in rice-fields.
Vern.—Masturia.

319. Tamarindus indica *Linn.*
Villages everywhere; also frequent in jungle, 500—3,000 feet.
Vern.—Imli.

320. Bauhinia tomentosa *Linn.*
Tamar, 500—1,000 feet; yellowish white flowers.

321. Bauhinia acuminata *Linn.*
Dorunda, 1,500—2,000 feet; grown as a garden hedge.
Vern.—Kaimo; flower white.

322. Bauhinia racemosa *Lamk.*
Palamow, 1,000—1,500 feet; also S. Damuda Ghat, Hazaribagh 1,500—2,000 feet, *Gamble.*

323. Bauhinia malabarica *Roxb.*

324. Bauhinia retusa *Ham.*
Jonha, 1,500—2,000 feet; Jaspur, 2,000—2,500 feet; Kochang, 2,000—2,500 feet.
Vern.—Kătchnār. Flowers eaten.

325. Bauhinia Vahlii *W. & A.*
Baragaon, 2,000—3,000 feet; Rampur, 1,500—2,000 feet; Kochang, 2,000—2,500 feet; Singbhum, 500—2,500 feet; Sirguja, 1,500—2,000 feet.
The bark-fibre, called "Chope" is used in the rough for tying house-roof timbers, etc.

326. Bauhinia variegata *Linn.*
Palamow, 1,000—1,500 feet; Sirguja, 1,500—2,000 feet.
Vern.—Kătchnăr, Kuinăr. This and several other Bauhinias, apparently, called by these names.

326A. Bauhinia purpurea *Linn.*

327. Entada scandens *Benth.*
Baragai Hills, 2,000—3,000 feet.

328. Leucaena glauca, *Benth.*
Ranchi aud Dorunda, 1,500—2,000 feet.
Vern.—Kapur-Kadam. Flowers white in terminal clusters of *mimosa*-like globes.

329. Mimosa pudica *Linn.*
Dorunda, roadsides ; common.
330. Mimosa rubricaulis *Lamk.*
331. Acacia Farnesiana *Willd.*
Toree, 1,000—1,500 feet ; frequent.
Vern.—Bābūl Bābŭla.
332. Acacia arabica *Willd.*
Grand Trunk Road, apparently rare.
Vern.—Bābūl.
333. Acacia Catechu *Willd.*
Sillee, 500—1,000 feet.
Vern.—Kadir, Kadir-gāch, Khair, Kut, Kutch. Catechu, *Eng.* Chips boiled and Kut (Catechu) obtained ; process seen at Huntergunge, Hazaribagh dist.
334. Acacia Intsia *Willd.—var.* Caesia *W. & A.*
Baragai Hill, 2,000—3,000 feet ; Jaspur, 2,000—2,500 feet.
Vern.—Arār. A shrub 10—15 feet high.
335. Acacia pennata *Willd.*.
Jaspur, 1,500—2,000 feet ; common.
Vern.—Arai. A climber.
336. Albizzia Lebbek *Benth.*
Ranchi, 1,500—2,000 feet; Mailpiri, Singbhum, 500—1,000 feet ; *Gamble.*
Vern.—Siriss. A tree 40—50 feet high; flower-heads white.
337. Albizzia odoratissima *Benth.*
338. Albizzia procera *Benth.*
339. Albizzia stipulata *Boiv.*
340. Enterolobium Saman *Prain.*
Planted. The Rain-tree.

XLII.—ROSACEÆ.

341. Pygeum Andersoni *Hook. f.*
342. Rosa involucrata *Roxb.*
Bonai state, on river-banks ; Palamow, banks of the Kose river.
Bonai-Tributary mehal-water-shed is towards the S and E., not Gangetic but between Ganges and Mahanadi.
343. Rosa centifolia *Linn.*
In gardens.
344. Rosa indica *Linn.*
In gardens.

345. Eriobotrya japonica *Lindl.*
Dorunda, 1,500—2,000 feet; cult.
Loquat. Fruit inconsiderable.

346. Fragaria vesca *Linn.*
All stations; cult. in gardens in the cold weather.
Strawberry.

347. Pyrus communis *Linn.*
Dorunda, etc., 1,500—2,000 feet; cult.
Vern.—Naspăti. The Pear. Fruit hard, barely eatable; used cooked.

XLIII.—CRASSULACEÆ.

348. Bryophyllum calycinum *Salisb.*
Palandu, 1,500—2,000 feet; cult.

349. Kalanchœ floribunda *W. & A.*

XLIV.—DROSERACEÆ.

350. Drosera Burmanni *Vahl.*
Hazaribagh, Mowdoe village, 1,000—1,500 feet; Sirguja and Jaspur, 1,500—2,000 feet; common.
Vern.—Agía. Sundew.

351. Drosera indica *Linn.*

XLV.—HALORAGEÆ.

352. Callitriche stagnalis *Scop.*
Sirguja, 1,500—2,000 feet; in still water near a stream.
[Not in Herb., Calcutta, from Chutia Nagpur.]

XLVI.—COMBRETACEÆ.

353. Terminalia Catappa *Linn.*
Chyebassa, 500—1,000 feet; cult.
Vern.—Bodām. Country Almond. Fruit eaten.

354. Terminalia belerica *Roxb.*
Dhakda, Manbhum, 500—1,000 feet.
Vern.—Bohora. A large tree; cattle eat the fruit.

355. Terminalia Chebula *Retz.*
Bankuli, 1,500—2,000 feet.
Vern.—Hări-tăki, Rola *Mundari* and *Ho.*

356. Terminalia Arjuna *Bedd.*
Palamow, 1,000—1,500 feet.
Vern.—Arjăn.

357. Terminalia tomentosa *Bedd.*
Sirguja, 1,500—2,000 feet; common in jungles.
Vern.—Ăsăn. Tusser silk worms fed on the leaves.
358. Anogeissus latifolia *Wall.*
Munka, Palamow, 1,000—1,500 feet.
Vern.—Dhaunta. Very common in all Chutia Nagpur jungles.
359. Anogeissus acuminata *Wall.*
360. Combretum nanum *Roxb.*
361. Combretum ovalifolium *Roxb.*
362. Combretum extensum *Roxb.*
363. Combretum decandrum *Roxb.*
Etkooree, Hazaribagh District, 1,000—1,500 feet; Jaspur 1,500—2,000 feet.
Vern.—Gŭrŭnda or Gorŭnda. A common climber; root used in fever.
364. Quisqualis indica *Linn.*
Common in gardens over trellises.
Quisqualis, *Eng.*

XLVII.—MYRTACEÆ.

365. Psidium Guyava *Linn.*
Dorunda, 1,500—2,000 feet; cult. in gardens.
Vern.—Ămrŭt. The Guava. Fruit eaten, but strong-smelling, so that some dislike it.
366. Eugenia operculata *Roxb.*—*var.* Obovata.
367. Eugenia Jambolana *Linn.*
Tirli nadi, 2,000—2,500 feet; Dorunda, 1,500—2,000 feet.
Vern.—Jămŭm; Chota jăm. A tree 50—60 feet; sometimes cultivated; fruit eaten and made into "port wine."
368. Eugenia Heyneana *Wall.*
369. Careya arborea *Roxb.*
Sirguja, 1,500—2,000 feet.
Vern.—Kumhi.
370. Eucalyptus globulus *Labill.*
Bankuli Tea Estate; planted—native of Australia.
Blue Gum. Supposed to prevent malaria where planted, but of no use.
371. Myrtus communis *Linn.*
Dorunda, 1,500—2,000 feet; planted in gardens.
Myrtle. A thriving bush up to seven feet high.

XLVIII.—MELASTOMACEÆ.

372. Osbeckia truncata *Don.*—*var.* Kurzii.
Parasnath, 4,200 feet *Kurz.*

373 Osbeckia chinensis *Linn.*
Santalia (Campbell & Watt).
No *Osbeckia* found or seen by the writer in Chutia Nagpur.

374. Melastoma malabathricum *Linn.*

375. Sonerila tenera *Royle.*
Jaspur, 1,000—1,500 feet; on banks by the wayside.
Vern.—Lăwangīa.

XLIX.—LYTHRACEÆ.

376. Ammannia peploides *Spreng.*
Ranchi, 1,500—2,000 feet.

377. Ammannia dentelloides *Kurz.*

378. Ammannia pygmaea *Kurz.*

379. Ammannia pentendra *Roxb.*
Pertabpur, Sirguja, 1,500—2,000 feet; moist soil near tank.
Var. Fimbriata *Wight.*
Jaspurnagar, 2,000—2,500 feet; in wet rice fields.
Vern.—Khet-gulab = "rose of the field."
Var. Illecebroides *Arn.*
Palandu, 1,500—2,000 feet.

380. Ammannia multiflora *Roxb.*

381. Ammannia baccifera *Linn.*
Chatra, 1,000—1,500 feet; flowers white.

382. Woodfordia floribunda *Salisb.*
Pitorea, 2,000—2,500 feet; common in jungles.
Vern.—Dhăwei, Dhai phŭl.

383. Lawsonia alba *Lamk.*
Ranchi, 1,500—2,000 feet; cult. as a hedge.
Vern.—Mehndi. Henna.

384. Lagerstrœmia indica *Linn.*
Ranchi and Hazaribagh; in gardens, common.
Crape Flower. Flowers white, pink or purple.

385. Lagerstrœmia parviflora *Roxb.*
Plateau generally.
Vern.—Sīd. One of the commonest bushes in scrub-jungle.

386. Punica Granatum *Linn.*
All stations from 500—2,000 feet; cultivated.
Vern.—Anar. Pomegranate. Fruit inferior in quality in Chutia Nagpur; flowers single or double.

L.—ONAGRACEÆ.

387. Jussiæa repens *Linn.*

388. Jussiæa suffruticosa *Linn.*

Guina, Pergunnah Toree 1,000—1,500 feet, Jaspur, 1,500—2,000 feet.

Vern.—Părsăti. Grows in water; flowers yellow; root spongy; in Jaspur the root boiled and liquid drunk for fever.

389. Ludwigia parviflora *Linn.*

390. Trapa bispinosa *Roxb.*

LI.—SAMYDACEÆ.

391. Casearia graveolens *Dalz.*

Jaspur, 1,500—2,000 feet.

Vern.—Rūch mūti, Ruch muchi. Leaves purple-red.

392. Casearia tomentosa *Roxb.*

Chătra, Hazaribagh, about 1,500 feet; Ranchi, 1,500—2,000 feet.

Vern.—Bēri. This is, with *Croton oblongifolium* and *Bnchanania* a very common scrub-jungle. At Chătra were seven trees together, 25—30 feet high, two feet diameter at six feet from the ground; not seen arboreal except here and one tree on Bālūmath Hill, 30 miles south of Chătra.

LII.—PASSIFLOREÆ.

393. Carica Papaya *Linn.*

Palandu, 1,400—2,000 feet; cult. in many native and European gardens.

Vern.—Papita. The Papaw. (Passiflora; Passion-flower; various species cult. on porches and trellises in European stations.)

LIII.—TURNERACEÆ.

394. Turnera ulmifolia *Linn.*

Ranchi, 1,500—2,000 feet, on roadsides, naturalized. A native of the West Indies.

LIV.—CUCURBITACEÆ.

395. Trichosanthes palmata *Roxb.*

396. Trichosanthes anguina *Wall.*

397. Gymnopetalum Cochinchinense *Kurz.*
Plateau, 1,500—2,000 feet *Clarke.*

398. Lagenaria vulgaris *Ber.*
Jaspur, 1,500—2,000 feet; by roadside, probably cult.
Vern.—Kădu.

399. Luffa graveolens *Roxb.*

400. Luffa acutangula *Roxb.*
Santalia (Campbell & Watt).
Vern.—Paror jhinga *Santal.*

401. Luffa amara *Roxb.*

402. Luffa echinata *Roxb.*—*var.* Longistylis.

403. Benincasa cerifera *Savi.*
Cult. The Pumpkin (*Firminger* only); White gourd.

404. Momordica Charantia *Linn.*
Chătra, Hazaribagh, 1,000—1,500 feet; cult.
Vern.—Kurela (*Firminger*).

405. Momordica dioica *Roxb.*

406. Cucumis trigonus *Roxb.*

407. Cucumis Melo *Linn.*
Cult. The Melon.

408. Cucumis sativus *Linn.*
Cult. The cucumber.

409. Citrullus vulgaris *Schrad.*
Cult. The water-melon.

410. Cephelandra indica *Naud.*

411. Cucurbita maxima *Duch.*
Cult. The common gourd.

412. Cucurbita moschata *Duch.*
Cult. The Musk-melon.

413. Cucurbita Pepo *DC.*
Cult. Rhe Pumpkin.

414. Bryonia laciniosa *Linn.*
Ranchi, 1,500—2,000 feet.

415. Mukia scabrella *Arn.*
Jaspur, 1,500—2,000 feet; in dry sal jungle.
Vern.—Kawa-tāmar. Fruit scarlet.

416. Zehneria Hookeriana *Arn.*
Jaspur, 1,500—2,000 feet.
Vern.—Băn-kūndri (1). Root used with milk in fever and for diarrhœa. [Not in Herb., Calcutta, from Chutia Nagpur.]

417. Zehneria umbellata *Thev.*
Baragaon Hill; also Sirguja, 1,500—2,000 feet.
Vern.—Băn-kūndri (2); Mūl. The root is eaten; it is radish-like and hourglass shaped.

LV.—CACTEÆ.

418. Opuntia Dillenii *Ham.*
Cochineal Cactus; naturalized.

LVI.—FICOIDEÆ.

419. Trianthema monogynum *Thw.*
420. Mollugo hirta *Thunb.*
421. Mollugo spergula *Linn.*
422. Mollugo stricta *Linn.*

LVII.—UMBELLIFERÆ.

423. Hydrocotyle asiatica *Linn.*
Sirguja, 1,500—2,000 feet; banks of the Rer river.
A ground-ivy like creeper.
424. Bupleurum mucronatum *W. & A.*
Sirguja 1,500—2,000 feet.
425. Apium graveolens *Linn.*
Ranchi, 1,500—2,000 feet; cult.
Celery.
426. Carum Roxburghianum *Benth.*
Caraway.
427. Carum copticum *Benth.*
Caraway.
428. Pimpinella Heyneana *Wall.*
Jaspur, Sitonga; also Jaspur, 2,000—2,500 feet.
Vern.—Tirio, Mărcheia. Root used in fever.
429. Seseli indicum *W. & A.*
430. Fœniculum vulgare *Gaerten.*
Cult. Fennel.
431. Peucedanum nagpurensis *Prain.*
432. Peucedanum graveolens *Benth.* Cult.
433. Pastinaca sativa *Linn.*
Cult. in gardens in Chutia Nagpur.
Parsnip.
434. Coriandrum sativum *Linn.*
435. Daucus Carota *Linn.*
Cult. The Carrot.

LVIII.—ARALIACEÆ.

436. Panax fruticosum *Linn.* Cult.
437. Heptapleurum venulosum *Seem.*
Plateau, 1,500—2,000 feet.
Vern.—Rai-datūm. Epiphytic on trees.
438. Heteropanax fragrans *Seem.*

LIX.—CORNACEÆ.

439. Alangium Lamarkii *Thw.*

LX.—CAPRIFOLIACEÆ.

440. Lonicera macrantha *DC.*
Stations of Chutia Nagpur, 500—2,000 feet; cultivated, very common for trellises and porches.
Chinese Honey-Suckle.

LXI.—RUBIACEÆ.

441. Anthocephalus Cadamba *Miq.*
Palandu, 1,500—2,000 feet; planted.
Vern.—Kădăm.
442. Adina cordifolia *Hook. f.*
Sillee, 1,000—1,520 feet; common.
Vern.—Kărăm. A large tree.
443. Stephegyne parvifolia *Korth.*
Hundrughag, 1,500—2,000 feet; Jabra, Hazaribagh district, 1,000—1,500 feet; Jaspurnagar, 2,000—2,500 feet, in a *sal* grove.
Vern.—Karmi, *local*; Guria *Kol.* A tree 30—40 feet high.
444. Hymenodictyon excelsum *Wall.*
Sitonga, Jaspur, 2,000—2,500 feet.
Vern.—Būrkūnd.
445. Wendlandia exserta *DC.*
Hazaribagh, 1,500—2,000 feet; Jaspur, 1,500—2,000 feet.
Vern.—Kūdi phūl. A shrub.
446. Wendlandia tinctoria *DC.*
Pitorea, 2,000—2,500 feet; Palamow 500—1,000 feet.
Vern.—Telei phūl.
447. Dentella repens *Forst.*
448. Hedyotis pinifolia *Wall.*
449. Hedyotis hispida *Retz.*

450. Oldenlandia corymbosa, *Linn.*
Chătra, 1,500—2,000 feet; flowers lavender, moist places by rice-fields.
451. Oldenlandia diffusa *Roxb.*
452. Oldenlandia Heynei *R. Br.*
453. Oldenlandia dichotoma *Kœnig.*
Santalia.
454. Oldenlandia gracilis *Hook. f.*
455. Oldenlandia nudicaulis *Roth.*
456. Anotis calycina *Wall.*
457. Mussænda macrophylla *Wall.*
In gardens.
458. Randia fasciculata *DC.*
459. Randia uliginosa *DC.*
Sirguja, 1,500—2,000 feet, common.
Vern.—Perar, Katai. A thorny shrub.
460. Randia dumetorum *Lamk.*
Ranchi, 1,500—2,000 feet; Jaspur, 2,000—2,500 feet.
Vern.—Mowna.
461. Gardenia gummifera *Linn. f.*
Kantnagar, Singbhum, 500—1,000 feet.
Vern.—Burui. Fruit eaten. Ashes boiled with *Sal* (*Shorea robusta*).
462. Gardenia latifolia *Ait.*
Poitrea, 2,000—2,500 feet; Baragaon, 2,000—2,500 feet; Jaspur 1,500—2,000 feet; Chyebassa, 500—1,000 feet.
Vern.—Păpra; Kărhar (Jaspur).
463. Gardenia turgida *Roxb.*
Baragaon, 2,000—2,500 feet; Jaspur, 1,500—2,000 feet.
Vern.—Dudri.
464. Hyptianthera stricta *W. & A.*
Dorunda, 1,500—2,600 feet, in gardens cult. for flowers; also wild in Chutia Nagpur jungles.
Vern—Karkar.
465. Knoxia corymbosa *Willd.*
Aurunga, Palamow, 1,000—1,500 feet; Jaspur 2,000—2,500 feet, on rocky knolls in scrub jungle.
Vern.—Bănjïra.
466. Knoxia brachycarpa *Br.*
467. Canthium didymum *Roxb.*
Sirguja, 1,500—2,000 feet; Santalia, about 2,000 feet.
Vern.—Garbha, Gojha *Santal.*

468. Ixora parviflora *Vahl.*

469. Pavetta indica *Linn.*—*var.* tomentosa.

Chătra, 1,500—2,000 feet; Jaspur, 2,000—2,500 feet; Sirguja, 2,000—2,500 feet; in sal jungle and on hills. *Vern.*—Inderjow (Chatra); Chereigora (Jaspur); Menda (Sirguja). A small tree 20 feet high; dry fruit adhering. (Another "Inderjow" is *Holarrhena antidysenterica*, = Kurchi, Dudhi, Koreia, etc.)

470. Coffea bengalensis *Linn.*

471. Coffea arabica *Linn.*

Pitorea, 2,000 feet; Bankuli; cultivated.

472. Morinda tinctoria *Roxb.*

473. Pæderia fœtida *Linn.*

Sillee, 1,000—1,500 feet; Hill near Pitorea 2,000—2,500 feet. Plant fœtid.

474. Hamiltonia suaveolens *Roxb.*

W. Hill, Pitorea, 2,000—2,500 feet; Jaspur, 2,000—2,500 feet, on rocky knolls in small jungle.

Vern.—Lila jan, *local*; Karha, *Hind.* Shrubby; flowers white, strong jasmine smell.

475. Spermacoce stricta *Linn. f.*

Jaspur, 2,000—2,500 feet; Sirguja, 1,500—2,000 feet, on dry rocks.

Vern.—Getia.

476. Spermacoce hispida *Linn.*

Santalia about 2,000 feet.

Vern.—Pitua arak. *Santal.*

477. Rubia cordifolia *Linn.*

LXIII.—COMPOSITÆ.

478. Vernonia teres *Wall.*—*var.* subsessilis.

Pitorea, 2,000—2,500 feet; Santalia.

Vern.—Char Sira, *Santal* (Campbell & Watt).

479. Vernonia Roxburghii *Less.*

Jaspur, 2,000—2,500 feet, common in dry jungle and in the open.

Vern.—Ghetia phūl. Flowers purple.

480. Vernonia cinerea *Less.*

Black rocks, Ranchi, 2,000—2,500 feet; Dorunda 1,500—2,000 feet, in gardens, common; Hazaribagh district, 1,500—2,000 feet; Jaspurnagar, 2,000—2,500 feet; Hetghat, Jaspur, 1,500—2,000 feet.

Vern.—Pāpar; Kŭnchli. Flowers purple; root sweet-smelling, given for dropsy.

481. Vernonia divergens *Benth.*
Parasnath, 4,000 feet (*F.B.I.*)

482. Vernonia anthelmintica *Willd.*
Sirguja, 1,500—2,000 feet; in once place only, under a *Pipal* tree; seven feet high.

483. Elephantopus scaber *Linn.*
Irulia, near Hundrughag, 1,500—2,000 feet; Pitorea, 2,000—2,500 feet; Jaspur, 2,000—2,500 feet.
Vern.—Tāl Mūli; Mūrgi chūndi (Jaspur).

484. Adenostemma viscosum *Fortst.*
Sirguja, 1,500—2,000 feet; in rice fields.
Vern.—Săki.

485. Ageratum conyzoides *Linn.*
Dorunda, 1,500—2,000 feet; a garden weed.

486. Cynathocline lyrata *Cass.*
Jaspur, 1,500—2,000 feet, in moist cultivated fields.
Vern.—Chickeni or Chik'ni.

487. Grangea maderaspatana *Poir.*

488. Erigeron asteroides *Roxb.*

489. Conyza stricta *Willd.*
Pitorea, 2,000—2,500 feet; Jaspur, 1,500—2,000 feet.
Vern.—Barango.

490. Blumea Wightiana *DC.*

491. Blumea glomerata *DC.*
Ranchi, 1,500—2,000 feet.

492. Blumea lacera *DC.*—*var.* cinerascens.
Dorunda 1,500—2,000 feet; a garden-weed.

493. Blumea laciniata *DC.*

494. Blumea membranacea *DC.*

495. Blumea Jacquemontil *Hook. f.*
Parasnath (*F.B.I.*).

496. Blumea oxyodonta *DC.*

497. Laggera flava *Benht.*
Ranchi, 1,500—2,000 feet; Jaspur 1,500—2,500 feet; very common in dry jungle.
Vern.—Bău Sirsu. Flowers yellow.

498. Laggera alata *Sch.-Bip.*

499. Laggera pterodonta *Benth.*

500. Laggera aurita *Sch-Bip.*

501. Sphæranthus indicus *Linn.*
Ranchi, 1,500—2,000 feet; on edges of rice-fields.

502. Gnaphalium luteo-album *Linn.*

503. Gnaphalium indicum *Linn.*

Sirguja, 1,500—2,000 feet; on dry grassy (maidan) open ground; flowers white.

504. Gnaphalium pulvinatum *Del.*

505. Cæsulia axillaris *Roxb.*

Pitorea, 2,000—2,500 feet, on the east hill, dry; granitic gneiss, rocky; Jaspurnagar, 2,000—2,500 feet; in wet rice fields.

Vern—Ghetia-kena (Jaspur); not eaten. A similar plant, if not the same, is used as a vegetable (sāg) for food, but it grows on the maidan and so is dry.

506. Vicoa auriculata *Cass.*

Jabra, Hezaribagh, 1,000—1,500 feet; Jaspur, 2,000—2,500 feet.

507. Pulicaria angustifolia *DC.*

Jaspur, 2,000—2,500 feet, on jungle ground.

Vern—Hūrhūria. This plant has milky juice when on *cultivated* ground.

508. Xanthium strumarium *Linn.*

509. Siegesbeckia orientalis *Linn.*

Jaspur, 1,500—2,000 feet.

Vern.—Bhūseri.

510. Eclipta alba *Hassk.*

Jaspur.

Vern.—Bengăria. Flowers white.

511. Wedelia Wallichii *Less.*

Santalia (Campbell & Watt).

512. Blainvillea latifolia *DC.*

513. Spilanthes Acmella *Linn.*

Ranchi.

Vern.—Bărbări'a.

514. Guizotia abyssinica *Cass.*

Bulrampur, Manbhum 500—1,000 feet; grown in fields largely, to 2,500 feet.

Vern.—Sirguja; sirgujia; ram til; kala til; ginjeri: this last is the local name in the *State* of Sirguja itself. An oil-seed—'Black Niger' of commerce.

515. Glossocardia linearifolia *Cass.*

516. Cosmos sulphureus *Cav.*

517. Bidens pilosa *Linn.*

Var. bipinnata.

Mahretta Tea State Hazaribagh, 2,000—2,500 feet.

518. Glossogyne pinnatifida *DC.*

Jaspur-nagar, 2,000—2,500 feet; Santalia (Campbell & Watt).

Vern.—Băn Jătni (Jaspur); Barrangom, Birbarangom, *Santal.*

519. Chrysanthellum indicum *DC.*

Seetagurrha Tea Estate, Hazaribagh, 2,000 feet. Flower yellow.

520. Tridax procumbens *Linn.*

Dorunda, 1,500—2,000 feet. Flowers yellow.

521. Chrysanthemum coronarium *Linn.*

Cult. in gardens.

522. Centipeda orbicularis *Lour.*

Santalia.

Vern.—Bedi Achim *Santal.*

523. Sphæromorphæa Russelliana *DC.*

524. Artemisia parviflora *Roxb.*

Sirguja, 1,500—2,000 feet; Parasnath, 4,000 feet (*F.B.I.*).

525. Emilia sonchifolia *DC.*

Jabra, Hundagunge, W. Hazaribagh, 1,000—1,500 feet; Sirguja, 1,500—2,000 feet. Flowers purple. According to a native (Moreed chuprassie) "the leaves bruised with arrack, good for sore eyes, the first day."

526. Echinops echinatus *DC.*

Baragon, 2,000—2,500 feet.

527. Cnicus arvensis *Hoffs.*

528. Saussurea candicans *Clarke.*

Kolhan, Singbhum Dist., 500—1,000 feet.

529. Voluntarella divaricata *Benth.*

530. Carthamus tinctorius *Linn.*

Palamow 500—1,000 feet; cultivated.

Vern.—Kūsūm (1). Safflower, the yellow dye plant. (Kūsūm (2) is *Schleichera trijuga*, a tree.)

531. Crepis japonica *Benth.*

532. Crepis acaulis *Hook. f.*

533. Sonchus asper *Vill.*

534. Sonchus oleracens *Linn.*

535. Sonchus arvensis *Linn.*

536. Launea aspleniifolia *DC.*

Jabra, Hazaribagh dist., 1,000—1,500 feet, on waste ground; Santalia, 500—2,000 feet.

Vern.—Ber malla *Santal.*

537. Launea nudicaulis *Sess.*
538. Scorzonera divaricata *Turez.*
Jaspur, 1,500—2,000 feet.
Vern.—Chăti'ăn. [Not in Herb. Calcutta, from Chutia Nagpur.]

LXIII.—STYLIDEÆ.

539. Stylidium tenellum *Sw.*—*var.* minima.

LXIV.—CAMPANULACEÆ.

540. Lobelia trigona *Roxb.*
Sirguja, 1,500—2,000 feet.
Flowers blue. Plant, when growing in water, up to 15 in.; on dry soil only 6 inches high.
541. Lobelia trialata *Ham.*
542. Lobelia affinis *Wall.*
543. Cephalostigma Schimperi *Hochst.*
Jaspur, 2,000—2,500 feet.
Vern.—Băn-dudhi; Dūdi-băn. Plant 9 inches high.
544. Cephalostigma hirsutum *Edgew.*
Parasnath (*F.B.I.*).
545. Cephalostimga Hookeri *Clarke.*
Parasnath (*F.B.I.*).
546. Wahlenbergia gracilis *DC.*
547. Sphenoclea zeylanica *Gærtn.*

LXV.—PLUMBAGINEÆ.

548. Plumbago zeylanica *Linn.*
Jonha, Sandi-mandi, 1,000—1,500 feet; here most probably wild.
549. Plumbago capensis *Thunb.*
All stations, 500—2,000 feet; cult. in gardens.
Plumbago *Eng.* A climber.

LXVI.—PRIMULACEÆ.

550. Anagallis arvensis *Linn.*
551. Centunculus tenellus *Duby.*

LXVII.—MYRSINEÆ.

552. Embelia robusta *Roxb.*—*var.* ferruginea *Wall.*
Jaspur, 2,000—2,500 feet.
Vern.—Săsapōra; Băbirŭng.

553. Ardisia humilis *Vahl.*
Ba ragaon, 2,000—2,500 feet.
Vern.—Lilibaha. Leaves glossy, laurel-like; flowers profuse, wax-plant-like.
Var. arborescens *Wall.*
Dhadka, Manbhum, 500—1,000 feet.
Vern.—Mormori. A small tree or shrub.

LXVIII.—SAPOTACEÆ.

554. Achras Sapota *Linn.*
Dorunda, 1,500—2,000 feet, cult.
Sapota. A small tree, the fruit comes to nothing in Chutia Nagpur.
555. Bassia latifolia *Roxb.*
Everywhere abundant, 500—2,500 feet, particularly in Palamow.
Vern.—Máhūa, Mŏwa.
556. Mimusops Elengi *Linn.*

LXIX.—EBENACEÆ.

557. Diospyros montana *Roxb.*
Rampur, near Palandu, 1,500—2,000 feet.
Vern.—Gara Tiril.
558. Diospyros Embryopteris *Pers.*
Ranchi, 1,500—2,000 feet.
Vern.—Makar Khend.
559. Diospyros tomentosa *Roxb.*
Plateau, 2,000 feet *Clarke.*
560. Diospyros melanoxylon *Roxb.*
All districts, 500—2,500 feet; common as scrub jungle.
Vern.—Khend, *local*; Tiril, *mundari.* Imitates "Bengal Fire," if stirred in a bonfire.
[Not in Herb., Calcutta, from Chutia Nagpur.]

LXX—STYRACEÆ.

561. Symplocos racemosa *Roxb.*
Ranchi, 1,500—2,000 feet; Jaspur 2,000,—2,500 feet; Sirguja. 2,000—2,500 feet; very common.
Vern.—Lodh, *general*, also Son Pokri (in Jaspur) and Makar Khend (in Sirguja); apparently the last name a mistake for *Diospyros Embryopteris.* A tree, 40 feet; root-bark used as a dye.

LXXI.—OLEACÆ.

562. Jasminum Sambac *Ait.*

563. Jasminum pubescens *Willd.*

Baragari, 2,000—3,000 feet; Jaspur 1,500—2,000 feet; Sirguja 1,500—2,000 feet.

Vern.—Hŭndi Baha; Jungli Chameile; Bŭrsi.

Flowers white with sweet jasmine smell.

564. Jasminum arborescens *Roxb.*

564. Jasminum Roxburghianum *Wall.*

566. Nyctanthes Arbor-tristis *Linn.*

Pitorea, 2,000—2,500 feet; Gunia, Toree Purgunnah, 1,000—1,500 feet; Sillee; etc. A very common shrub throughout Chutia Nagpur.

567. Schrebera Swietenioides *Roxb.*

568. Linociera intermedia *Wight—Var.* Roxburghii.

LXXII.—APOCYNACEÆ.

569. Carissa Carandas *Linn.*

Palandu, cult.

Currownda *Eng.*

570. Carissa spinarum *A.D.C.*

Munka, Palamow, 1,000—1,500 feet; Dorunda, 1,500—2,000 feet.

Vern.—Korōnda. Fruit eaten; probably a state of *C. Carandas* (Brandis, Clarke).

571. Vinca rosea *Linn.*

All stations in Chutia Nagpur; cult. in gardens.

572. Plumeria acutifolia *Poir.*

All stations, 500—2,000 feet; cult.

Flowers offered to idols; strong jasmine smell.

573. Holarnhena antidysenterica *R. Br.*

Munka, Palamow, 1,000—1,500 feet; Baragaon 2,000—3,000 feet; Jaspur, 1,500—2,000 feet; Palandu, 1,500—2,000 feet; the commonest shrub in the jungles; seldom seen as trees.

Vern.—Dudhi; Koreia; Bär-ki-Dudhi; the seeds=Inderjow. A good wood for turning.

574. Tabernæmontana coronaria *R. Br.*

Baragaon, 2,000—2,500 feet; grown in gardens.

Vern.—Toa had.

575. Vallaris Heynei *Spreng.*

Pochra, Toree pergunnah, 1,000—1,500.

Vern.—Toriar. A climber, flower white.

576. Wrightia tomentosa *R. & S.*
Baragaon, 2,000—3,000 feet.
Vern.—Kunel (Firminger).
577. Nerium odorum *Soland.*
Cultivated throughout Chutia Nagpur.
Oleander. Flowers pink or white.
578. Beaumontia grandiflora *Wall.*
Palandu, 1,500—2,000 feet; cult.
579. Ichnocarpus frutescens *R. Br.*
Palamow 500—1,000 feet; Jaspur 2,000—2,500 feet.
Vern.—Chota dudhi; Guri lerŭng. Root good for fever.
580. Ichnocarpus ovalifolius *A. DC.*
(Allamanda cathartica *Linn.* and Thevetia neriifolia *Juss.*
Exotic members of this order are cult. in Chutia Nagpur.)

LXXIII.—ASCLEPIADEÆ.

581. Hemidesmcus indius *R. Br.*
Ranchi, 1,500—2,000 feet; common in jungles.
Vern.—Ănăntomūl. Indian sarsaparilla.
582. Cryptolepis Buchanani *R. & S.*
Vern.—Ulri Dudhi (Campbell & Watt).
583. Cryptostegia grandiflora *R. Br.*
Hazaribagh, 1,500—2,000 feet; cult.
584. Calotropis gigantea *R. Br.*
In jungles and open ground; frequent about villages.
Vern.—Mădār; Phalti. Flowers purple.
585. Calotropis procera *R. Br.*
586. Daemia extensa *R. Br.*
587. Cynanchum Callialata *Ham.*
Parasnath, 4,500 feet, *Hooker.*
588. Asclepias Curassavica *Linn.*
589. Raphistemma pulchellum *Wall.*
590. Holostemma Rheedei *Wall.*
591. Gymnema hirsutum *W. & A.*
592. Sarcostemma brevistigma *Wight.*
593. Dregea volubilis *Benth.*
Kudia Lotiva village, Lohardugga dist., 1,500—2,000 feet.
594. Hoya pendula *Wight.*
595. Ceropgia hirsuta *Wight.*

LXXIV.—LOGANIACEÆ.

596. Mitreola oldenlandioides *Wall.*
597. Mitrasacme alsinoides *R. Br.*

598. Buddleia asiatica *Lour.*

599. Strychnos Nux-vomica *Linn.*
Bend, Dalbhum, 500—1,000 feet.
Vern.—Kūchlia, *Beng.* (Roxbur gh).

600. Strychnos potatorum *Linn. f.* Cleaning-nut.

LXXV.—GENTIANACEÆ.

601. Exacum tetragonum *Roxb.*
Ranchi, 1,500—2,000 feet; Hundrughag, 1,500—2,000 feet; Iaspur, 1,500—2,000 feet.
Vern.—Orka phūl. Common beside wet rice-fields, sometimes over 4 feet high. Root given in fever, with black pepper, as a mild bitter.

602. Exacum pedunculatum *Linn.*

603. Exacum petiolare *Griseb.*

604. Hoppea dichotoma *Willd.*
Jaspur, 1,500—2,000 feet; Tatapāni, Sirguja, 2,000 feet.
Vern.—Sekoi. In moist places; near hot mineral springs.

605. Canscora diffusa *R.Br.*
Guona, Toree Pergunnah, 1,500—2,000 feet; Byturnee river, towards Keonjar, 500—1,000 feet; Jaspur, 1,500—2,000 feet; common in shady moist places.

606. Canscora decussata *R. & S.*
Balunath, Toree Pergunnah, 1,000—1,500 feet; Jaspur—1,500—2,000 feet; Sirguja, 2,000 feet; common; flowers white; no local name.

607. Swertia pulchella *Ham.*
Jaruda, Singbhum, 1,000—1,500 feet.
[Not in Herb., Calcutta, from Chutia Nagpur.]

608. Swertia affinis *Clarke.*

609. Limnanthemum cristatum *Griseb.*
Sirguja, 1,500—2,000 feet.

610. Limnanthemum indicum *Thev.*
Būndū, 500—1,000 feet.

LXXVI.—POLEMONIACEÆ.

611. Phlox Drummondi *Hook.*
In gardens in "cold weather."

LXXVII.—HYDROPHYLLACEÆ.

612. Hydrolea zeylanica *Vahl.*

LXXVIII.—BORAGINEÆ.

613. Cordia Myxa *Linn.*
Ramkūnda, Palamow 500—1,000 feet; Jilmille, Sirguja, 1,500—2,000 feet; Sirguja, 1,500—2,000 feet.
Vern.—Bahuar. A tree, 30—40 feet high.

614. Cordia obliqua. *Willd.*—*var.* Wallichii.

615. Cordia Macleodii *H. f.* & *T.*
Kuru (Chandwa) Ghat, Lohardugga, 1,500—2,000 feet; Sirguja, 1,500—2,000 feet.
Vern.—Belwalŭng. A small tree in scrub jungle.

616. Ehretia laevis *Roxb.*
Jonha, 1,000—1,500 feet. A tree, 30 feet high.

617. Coldenia procumbens *Linn.*

618. Rhabdia lycioides *Mast.*

619. Heliotropium strigosum *Willd.*

620. Heliotropium marifolium *Retz.*

621. Heliotropium indicum *Linn.*

622. Trichodesma indicum *R. Br.*

623. Trichodesma zeylanicum *R. Br.*
Hundrughag, Lohardugga, 1,500—2,000 feet.

623A. Cynoglossum denticulatum *A. DC.*

LXXIX.—CONVOLVULACEÆ.

624. Erycibe paniculata *Roxb.*
Baragaon, 2,000—3,000 feet.; Sirguja, 1,500—2,000 feet.
Vern.—Hūru bīd; Koel=gumār, (Sirguja). A climber; fruit eaten.

625. Rivea ornata *Choisy.*
Jaspur, 1,500—2,000 feet.
Vern.—Bhita bhonoria. A shrub, 12 feet high.
[Not in Herb., Calcutta, from Chutia Nagpur.]

626. Rivea hypocrateriformis *Choisy.*
Tatapani, Sirguja, 1,500—2,000 feet.
Midnapore Creeper (*Firminger*). A climber.

627. Argyreia speciosa *Sw.*

628. Argyreia Daltoni *Clarke.*
Jaspur, 2,000—2,500 feet.
Vern.—Chitti. A climber, ropes made of the bark.

629. Argyreia nervosa *Boj.*
Dorunda, 1,500—2,000 feet; climber in gardens and on porches.
"Elephant creeper," *Eng.*

630. Lettsomia aggregata *Roxb.*
Tainmara to Bundu, on ghat, 1,500—2,000 feet.
[Not in Herb., Calcutta, from Chutia Nagpur.]

631. Lettsomia bella *Clarke.*
Sirguja, 1,500—2,000 feet.
Calyx lined with crimson ; capsule scarlet within.

632. Lettsomia setosa *Roxb.*
Jaspur, 1,500—2,000 feet.
Vern.—Băktchi phūl. A jungle climber.

633. Ipomœa bona-nox *Linn.*
Stations, etc., Cult.
Moonflower.

634. Ipomœa muricata *Jacq.*
Sirguja, 1,500—2,000 feet ; among village jungle, doubtful cult.

635. Ipomœa phœnicea *Roxb.*

636. Ipomœa Quamoclit *Linn.*
Cult. in most stations, 500—2,000 feet.

637. Ipomœa hederacea *Jacq.*
Sirguja; 1,500—2,000 feet ; on village fences, doubtful cult. In light-purple flower here.

638. Ipomœa purpurea *Lamk.*
Cult. ; common.
Morning glory.

639. Ipomœa barlerioides *Benth.*

640. Ipomœa calycina *Benth.*

641. Ipomœa digitata *Linn.*

642. Ipomœa Batatas *Lamk.*
All stations, 500—2,000 feet.
Vern—Săkărkănd. Sweet Potato.

643. Ipomœa pes-tigridis *Linn.*
Mahretta, Hazaribagh, 2,000—2,500 feet.

644. Ipomœa eriocarpa *R. Br.*
Mahretta, 2,000—2,500 feet ; Jaspur, 2,000—2,500 feet.
Vern.—Kijuli (2). (In spite of the name ; it does not cause itchiness : another kijuli is *Mucuna pruriens*, which does.)

645. Ipomœa tridentata *Roth.*

646. Ipomœa chryseides *Ker.*

647. Ipomœa obscura *Ker.*
Rudia-Lotwa Tea Estate, 1,500—2,000 feet.

648. Ipomœa reniformis *Choisy.*

649. Ipomœa sepiaria *Koen.*
Sirguja, 1,500—2,000 feet; near water-courses.
650. Ipomœa aquatica *Forsk.*
651. Ipomœa cymosœa *R. & S.*
Gunia, Toree Pergunnah, 1,500—2,000 feet.
652. Ipomœa petaloidea *Choisy.*
653. Ipomœa Turpethum *R. Br.*
654. Ipomœa vitifolia *Sw.*
Kewatbar, Palamow, 1,000—1,500 feet. Flowers bright yellow. Sometimes cult. on trellises.
655. Ipomœa quinata *R. Br.*
(Other species are cult. in gardens.)
656. Convolvulus pluricaulis *Choisy, var.* macra.
Sirguja, 1,500—2,000 feet; on paths and dry *maidāns.*
Flowers, white, size of a shilling.
657. Evolvulus alsinoides *Linn.*
Dorunda, 1,500—2,000 feet; Jaipur 1,500—2,000 feet; Sirguja, 1,500—2,000 feet.
Flowers blue; common on dry *maidāns.*
658. Jacquemontia violacea *Choisy.*
Cultivated.
659. Porana paniculata *Roxb.*
Chutupalughat, 1,500—2.000 feet; Jaspur, 1,500—2,000 feet, also cult. in Ranchi; not so common in Jaipur jungles.
Vern.—Jharo (1) (Jaspur.) (Jharo (2) *Justicia simplex* (Acanthaceæ)).
660. Cuscuta reflexa *Roxb.*
Koru Chandwa ghat, 1,500—2,000 feet; Sirguja, 1,500—2,000 feet.
A "Dodder."

LXXX.—SOLANACEÆ.

661. Solanum nigrum *Linn.*
Palamow Forts, 1,000—1,500 feet; Chatrā, Hazaribagh 1,500—2,000 feet in cult. fields.
Plant about 12 in. high fruit eaten.
662. Solanum tuberusum *Linn.*
Villages and stations; cult. 500—2,500 or 3,000 feet.
Vern.—Alu, Aru. The Potato. Green tops also eaten as a vegetable (*sāg*).
663. Solanum vervascifolium *Linn.*
664. Solanum tervum *Sw.*

665. Solanum indicum *Linn.*
Chuta Pulughat, 1,500—2,000 feet; Jaspurnagar, 2,000—2,500 feet.
Vern.—Kūtūa. The fruit used as medicine in fever.

666. Solanum Melongena *Linn.*
Villages; cult. sometimes even in fields.
Vern.—Brinjal; Beúgan; Begūn. The Egg-Plant or Aubergine (Firminger).

667. Solanum xanthocarpum *Schr. & Wend.*
Kautnagar, Singhbhum, 500—1,000 feet.
Vern.—Răt-kăt-jănūm. The bud and flower, with salt (solution) good for watery eyes.

668. Lycopersicum esculentum *Mill.*
All stations, 500—2,500 feet; cult.
Vern.—Belāti Beúgăn. The Tomato. Grows well in the open in the Chutia Nagpur.

669. Physalis minima *Linn.*
Tangratola and Gerla villages, Jaspur, 2,000—2,500 feet.
Vern.—Rani-pŭcco.

670. Physalis peruviana *Linn.*
Stations, 500—2,500 feet; cult., commonly, in gardens.
Vern.—Tĭpāri. Cape gooseberry. Good jam made of the fruit.

671. Capsicum frutescens *Linn.*
Bankuli and Palandu Tea estates, 1,500—2,000 feet cult.
Vern.—Lal Miritch. The chillee.

672. Capsicum minimum *Roxb.*
Cult., common.
Bird's-eye chillee, *Eng.*

673. Capsicum grossum *Willd.*
Cult.
Bell Pepper, *Eng.*

674. Datura fastuosa *Linn.*

675. Datura Stramonium *Linn.*
Gunia, Toree Pergunnah, 1,500—2,000 feet; growing by the *thana.*
Vern.—Datura *Hind.*
[Not in Herb., Calcutta, from Chutia Nagpur.]

676. Nicotiana Tabacum *Linn*
Palandu, 1,500—2,000 feet; cult.
Vern.—Tămācu. Tobacco.

677. Nicotiana rustica *Linn.*

LXXXI.—SCROPHULARINEÆ.

678. Russelia juncea *Zucc.*
Palandu, cult.; common in gardens.
679. Maurandia Barclaiana *Lindl.*
Stations; cult. on trellis work.
680. Lophospermum scandens *Don.*
Cult., most stations.
681. Celsia coromandeliana *Vahl.*
682. Linaria ramosissima *Wall.*
683. Mazus rugosus *Lour.*
Chatrā, Hazaribagh, 1,500—2,000 feet.
684. Lindenbergia urticifolia *Lehm.*
Pitorea, 2,000—2,500 feet.
685. Stemodia viscosa *Roxb.*
686. Limnophila Roxburghii *G. Don.*
687. Limnophila conferta *Benth.*
Jaspur, 1,500—2,000 feet, in water.
Vern.—Gadsi.
688. Limnophila diffusa *Benth.*
689. Limnophila sessiliflora *Bl.*
Sirguja, 1,500—2,000 feet, in water.
690. Limnophila gratissima *Bl.*
691. Limnophila racemosa *Benth.*
Santalia.
Vern.—Choto lutur, *Santal.* (Campbell & Watt.)
692. Limnophila heterophylla *Benth.*
693. Limnophila gratioloides *R. Br.*
Sirguja, 1,500—2,000 feet; on wet ground by a stream.
694. Herpestis Monnieria *H. B. K.*
Baragaon, 2,000—2,500 feet.
695. Herpestis Hamiltoniana *Benth.*
696. Dopatrium junceum *Roxb.*
Santalia (*Campbell & Watt*).
697. Torenia cordifolia *Roxb.*
Parasnath, to 4,000 feet. (*F. B. I.*)
698. Torenia pedunculata *Benth.*
699. Vandellia crustacea *Benth.*
700. Vandellia Hookeri *Clarke.*
Parasnath (*F. B. I.*)
701. Vandellia erecta *Benth.*
702. Vandellia angustifolia *Benth.*
703. Ilysanthes hyssopoides *Benth.*
Sirguja, 1,500—2,000 feet; in water of small streams. Flowers purple. [Not in Herb., Calcutta, from Chutia Nagpur.]

704. Ilysanthes parviflora *Benth.*
705. Bonnaya brachiata *Link & Otto.*
706. Bonnaya veronicæfolia *Spreng.*
707. Scoparia dulcis *Linn.*
Sitonga, Jaspur, 2,000—2,500 feet; Dorunda, 1,500—2,000 feet; a garden weed.
Vern.—Hŭrhŭria (Jaspur). Flowers white.
708. Alectra indica *Benth.*
Parasnath, 4 000 feet. (*F. B. I.*)
709. Alectra? Thomsoni *Hook. f.*
Parasnath, 3,000 feet. (*F. B. I.*), "parasitic on *Strobilanthes.*"
710. Buchnera hispida *Ham.*
Sirguja, 2,000—2,500 feet, on a dry rock ghat road.
Stem leafless; 25 inches high.
711. Striga lutea *Lour.*
712. Striga euphrasioides *Benth.*
713. Centranthera hispida *R. Br.*
714. Centranthera humifusa *Wall.*
Parasnath (*F. B. I.*)
715. Sopubia delphinfolia *G. Don.*
Parasnath (*F, B. I.*)

LXXXII.—OROBANCHACEÆ.

716. Aeginetia indica *Linn.*
Santalia.
Vern—Pathu orot *Santal.*
717. Orobanche indica *Ham.*
Kotarki, Sirguja, 1,500—2,000 feet; growing plentifully on field-mustard.
Flower purple-blue.

LXXX—LENTIBULARIEÆ.

718. Utricularia stellaris *Linn. f.*
719. Utricularia flexuosa *Vahl.*
720. Utricularia exoleta *R. Br.*
721. Utricularia bifida *Linn.*
Jaspur, 2,000—2,500 feet.
Vern.—Masuria. Flowers yellow, growing on wet soil-rice-stubble.
722. Utricularia racemosa *Wall.*
Jaspur, 2,000—2,500 feet.
Vern.—Masuria. Flowers, purple.
723. Utricularia hirta *Klein.*

LXXXIV.—GESNERACEÆ.

724. Didyamocarpus pygmæa *C. B. Clarke.*
Lohardugga, 1,500—2,000 feet, *Clarke.*

725. Rhynchoglossum obliquum *Bl.—var.* parviflora.
(Achimenes sp.; cult. in pots ; all stations, 500—2,000 feet.)

LXXXV.—BIGNONIACEÆ.

726. Millingtonia hortensis *Linn. f.*
Ranchi, common, 1,500—2,000 feet, planted in avenues.
(Bastard) Cork-tree. Very graceful; upset by wind.

727. Oroxylum indicum *Vent.* (*Bignonia indica* Roxb.)
Sitonga village, Jaspur, 2,000—2,500 feet; Hetgagh, Jaspur, 1,500—2,000 feet; Runka village, Palamow, 1,500—2,000 feet.
Vern.—Ginjen; Dak-dawa; Sicat (Palamow). A tree up to 40 feet high; capsule 2—3 feet long, 2—4 inches broad; seeds purgative.

728. Bignonia venusta *Ker-Gawl.*
All stations, cult; common, 500—2,000 feet.
Vern.—Chirere. A climber, orange-scarlet flowers, inch long, in clusters.

729. Tecoma jasminoides *Lindl.*
Ranchi, 1,500—2,000 feet; cult.
A scandent shrub, very beautiful; flowers rosy-white with dark purple centres (Firminger).

730. Tecoma stans *Juss.*
Stations, cult., 1,500—2,000 feet.
A shrub, 6—8 feet high; flowers large, golden-yellow.

731. Stereospermum suaveolens *DC.*
Dorunda 1,500—2,000 feet, roadside tree; Sirguja 1,500—2,000 feet.
Vern.—Papré, Siriss, Padar (Chutia Nagpur proper,. The name *Siriss,* given as well as Papré, in Sirguja, is possibly by mistake for some other tree, say *Albizzia Lebbek,* which is also *Siriss.*

LXXXVI.—PEDALINEÆ.

732. Martynia diandra *Glox.*
Ranchi, 1,500—2,000 feet.
Tiger-claw, Devil's-claw; an American weed.

733. Sesamum indicum *DC.*
Villages, frequent by middens; also cult. in fields for oil-seeds, 500—2,000 feet.
Vern.—Krishna-til; Til.

LXXXVII.—ACANTHACEÆ.

734. Thunbergia fragrans *Roxb. var.* lævis.
735. Thunbergia tomentosa *Wall.*
736. Thunbergia alata *Boj.*
Cult., common about Ranchi; ? naturalized.
737. Thunbergia grandiflora *Roxb.*
Dorunda, 1,500—2,000 feet, cult., on trees.
738. Thunbergia laurifolia *Lindl.*
Ranchi, 1,500—2,000 feet, cult.
738A. Elytraria crenata *Vahl.*
739. Nelsonia campestris *R. Br.*
739A. Hygrophila polysperma *T. And.*
740. Hygrophila salicifolia *Nees.*
741. Hygrophila quadrivalvis *Nees.*
742. Hygrophila spinosa *T. And.*
Jaspur, 2,000—2,500 feet.
Vern.—Dhéla Kanta. Flowers blue, common in moist places.
743. Ruellia prostrata *Lamk.*
Common; flowers purple.
744. Ruellia cernua *Roxb.*
745. Ruellia suffruticosa *Roxb.*
746. Petalidium barleriodes *Nees.*
747. Phaylopsis parviflora *Willd.*
748. Dædalacanthus nervosus *T. And.*
Bandgaon, 2,000—2,500 feet.
Flowers blue.
749. Dædalacanthus purpurascens *T. And.*
Bandgaon, 2,000—2,500 feet; Pertabpur, Sirguja, 1,500—2,000 feet; in scrub jungle.
Flowers blue.
750. Hemigraphis latebrosa *Nees.*
Tamar, 500—1,000 feet.
751. Strobilanthes auriculatus *Nees.*
Jaspur, 1,500—2,000 feet; on rocky hill-tops.
Vern.—Bainsa phūl. Said to flower every three years.
752. Strobilanthes sabinianus *Nees.*
Palandu, 1,500—2,000 feet, cult. in garden.

753. Blepharis bœrhaaviæfolia *Pers.*
754. Blepharis mollūginifolia *Pers.*
755. Barleria Prionitis *Linn.*
Santalia (Campbell & Watt).
Vern.—Kanta phūl, *Santal.*
756. Barleria strigosa *Willd.*
Tamar ghat, 1,500—2,000 feet; also cult. in gardens.
757. Barleria cristata *Linn*
Pitorea, East hill, 2,000—2,500 feet; Jaspur, 2,000—2,500 feet; Sirguja 1,500—2,000 feet; and elsewhere on ghats and in dry jungle.
Vern.—Gokhura (in Jaspur, where the Zemindar insists that this is very *local* plant).
758. Andrographis paniculata *Nees.*
Pitorea, East hill, 2,000—2,500 feet; Sirguja 1,500—2,000 feet.
Vern.—Kalmeg, Charayta. The Creat *Eng.*; used as a medicine; one of the *Chirettas.*
759. Andrographis echioides *Nees.*
760. Lepidagathis Hamiltoniana *Wall.*
761. Lepidagathis trinervis *Nees.*
762. Lepidagathis hyalina *Nees.*
763. Lepidagathis purpuricaulis *Nees.*
764. Lepidagathis fasciculata *Nees.*
765. Justicia Betonica *Linn.*
Ramandag reserve, Palamow, 1,000—1,500 feet, *Gamble*; Jaspurnagar 2,000—2,500 feet.
Vern.—Chitowr.
766. Justicia Gendarussa *Linn.*
767. Justicia quinqueangularis *Nees.*
Ranchi, 1,500—2,000 feet.
768. Justicia diffusa *Willd.*
Sirguja, 1,500—2000, common.
Flowers purple.
769. Justicia simplex *Don.*
Jaspur, 2,000—2,500 feet.
Vern.—Jharo.
770. Justicia procumbens *Linn.*
Jonha to Sandimandi,* 1,000—1,500 feet. (Not in Herb., Calcutta, from Chutia Nagpur.)

* Sandimandi (Mundari)="Adam and Eve." A waterfall, south of Jonha Police Station and Dak Bungalow; a romantic glen and 100 feet fall, very beautiful—*J. F. W.*

771. Adhatoda Vasica *Nees.*
Pitorea, East hill, 2,000—2,500 feet.

772. Rhinacanthus communis *Nees.*
Palandul 1,500—2,000 feet, *A. Cooke.*

773. Rungia parviflora *Nees—var.* pectinata.
Jabra, S. of Chatra, Hazaribagh, 1,000—1,500 feet, very thickly distributed on the ground under Bur (*Ficus bengalensis*) trees; Pitorea, East Hill, * 2,000—2,500 feet; Jaspur, 2,000—2,500 feet, on dry rocky knolls; Sirguja, on dry rocks.
Vern.—Lila-jān (Jaspur). Flowers blue and elastic *seed* (? fruit).

774. Dicliptera micrantha *Nees.*

775. Dicliptera Roxburghiana *Nees.*
Pitorea, East Hill, 2,000—2,500 feet.

776. Peristrophe bicalyculata *Nees.*
Toree pergunnah, 1,000—1,500 feet on waste land.
Flowers white, purple blotch on upper limb of bipartite corolla.

LXXXVIII.—VERBENACEÆ.

777. Lantana indica *Roxb.*

778. Lantana Camara *Linn.*
Dournda, 1,500—2,000 feet; cult. and wild.
A Brazilian plant, makes a straggling hedge.

779. Lippia nodiflora *Rich.*

780. Lippia geminata *H. B. K.*

781. Aloysia citriodora *Orteg.*
All stations, cult. in gardens and pots.
Lemon-scented Verbena, *Eng.*

782. Stachytarpheta indica *Vahl.*
Ranchi, 1,500—2,000 feet.
Flowers blue, or pink.

783. Verbena officinalis *Linn.*

784. Duranta Plumieri *Jacq.*
Bankuli Tea-Estate, 1,500—2,000 feet; common, cult. as hedges.
Duranta *Eng.*; American; flower blue, berries orange; dull green leaf. One variety has spines, this has none.

* This hill is granitic gneiss, much broken up, but not large rocks, and jungle covered.—*J. J. W.*

785. Callicarpa arborea *Roxb.*
Dhadka, Manbhum, 500—1,000 feet; Jaigri, Palamow, 1,500—2,000 feet. *Gamble.*
Vern.—Harula. Birds eat the fruit.

786. Callicarpa macrophylla *Vahl.*
Barasand, Palamow. *Gamble.*

787. Tectona grandis *Linn.*
Ranchi and Dorunda, 1,500—2,000 feet; cult. but does not thrive; the trees are about 20 feet or so.
Teak *Eng.*

788. Premna latifolia *Roxb.*

789. Premna herbacea *Roxb.*

790. Gmelina arborea *Linn.*
Palandu Tea-Estate, 1,500—2,000 feet. *A. Cooke.*
Vern.—Gumhár.

791. Vitex Negundo *Linn.*
Jaspur, 2,000—2,500 feet, common as hedges near villages.
Vern—Senduár. A shrub, to 15 feet and upwards.

792. Vitex peduncularis *Wall.*
Bandgaon, 2,000—2,500 feet.

792A. Clerodendron phlomoides *Linn.*

793. Clerodendron serratum *Spreng.*
Hundrughag, 1,500—2,000 feet; Mahretta Tea Estate, 2,000—2,500 feet.

794. Clerodendron infortunatum *Gœrtn.*
Jingi, Lohardagga, 1,500—2,000 feet; Dorunda.
A roadside weed (scrub jungle) in Dorunda.

795. Clerodendron Siphonanthus *R. Br.*
Ranchi, 1,500—2,000 feet; Jaspur, 1,500—2,000 feet; Sirguja 1,500—2,000 feet.
Vern—Parola (Jaspur). Flowers September or earlier.

796. Clerodendron Thomsoni *Balf.*
Ranchi, cult. in gardens.
(Other species of Clerodendron are cultivated in stations.)

797. Holmskioldia sanguinea *Retz.*
Pitorea, East hill, 2,000—2,500 feet.

798. Petraea volubilis *Linn.*
Cult. in gardens and on trellises.
A red-stemmed, blue-flowered climber.

799. Symphorema polyandrum *Wight.*

LXXXIX.—LABIATÆ.

800. Ocimum canum *Sims.*

801. Ocimum Basilicum *Linn.*
Santalia (Campbell & Watt).
Vern.—Dimbu Baha, Mali Baha, *Santal.*

802. Ocimum gratissimum *Linn.*
Sillee, 500—1,000 feet; Jaspur, 2,000—2,500 feet.
Vern.—Kāla tūlsi; Dimbu phūl, Ban tūlsi.

803. Ocimum sanctum *Linn.*
Tamar, 500—1,000 feet; Tantanagar, Singbhum, 500—1,000 feet.
Vern.—Tūlūsi, Tulsi, Atchamba. Used in hæmaturia.

804. Acrocephalus capitatus *Benth.*
Santalia (Campbell & Watt).

805. Orthosiphon pallidus *Royle.*

806. Orthosiphon rubicundus *Benth.*

807. Orthosiphon stamineus *Benth.*

808 Plectranthus ternifolius *Don.*

809. Plectranthus incanus *Link.*
Sirguja, 1,500—2,000 feet, among dry rocks in open pasture land.

810. Coleus barbatus *Benth.*
Parasnath, 4,500 feet, *Thomson.*

811. Coleus aromaticus *Benth.*
In gardens, cult most stations.

812. Coleus scutellarioides *Benth.*
In gardens, cult.

813. Anisochilus carnosus *Wall.*
Jaspur, 2,000—2500 feet; Sirguja, 1,500—2,000 feet; on rocky knolls.
Vern.—Chota pipar.

814. Hyptis suaveolens *Poit.*
Vern.—Gunga tūlsi (Campbell & Watt).

815. Lavandula Burmanni *Benth*

816. Pogostemon plectranthoides *Desf.*
Hazaribagh, 1,500—2,000 feet; also top of Parasnath, *Hooker.*

817. Dysophylla cruciata *Benth.*
Sirguja, 1 500—2,000 feet.
Head of flowers purple; grows in or near water.

818. Dysophylla verticillata *Benth.*

819. Dysophylla pentagona *C. B. Clarke.*
Singbhum, 2,000 feet.

820. Colebrookia oppositifolia *Sw.*
Pitorea, East Hill, 2,000—2,500 feet.
821. Micromeria capitellata *Benth.*
822. Micromeria biflora *Benth.*
Chama, Lohardugga dist., 1,500—2,000 feet.
Flowers small, light purple.
823. Calamintha umbrosa *Benth.*
824. Salvia plebeja *R. Br.*
825. Nepeta ruderalis *Ham.*
826. Anisomeles ovata *R. Br.*
827. Leucas lanata *Benth.—var.* nagpurensis.
828. Leucas montana *Spreng.*
829. Leucas mollissima *Wall.*
Mahretta Tea Estate, 2,000—2,500 feet.
Var. scaberula.
Jaspur, 2,000—2,500.
Vern.—Bibi gora.
830. Leucas Clarkei *Hook f.*
831. Leucas nutans *Spreng.*
832. Leucas Cephalotes *Spreng.*
Santalia (Cambell & Watt).
Vern.—Dhurpi sag *Hind.* Andia durap arak, *Santal.*
833. Leucas martinicensis *R. Br.*
834. Leucas hyssopifolia *Benth.*
835. Leucas aspera *Spreng.*
836. Leucas linifolia *Spreng.*
837. Leonotis nepetæfolia *R. Br.*
Chatra, 1000—1,500 feet.
Reaches six feet in height.
838. Ajuga macrosperma *Wall.—var.* breviflora.

XC.—NYCTAGINEÆ.

839. Mirabilis Jalapa *Linn.*
Stations, 500—2,000 feet, cult.
Marvel of Peru.
840. Boerhaavia repens *Linn.*
Kewatbar, Palamow, 1,000—1,500 feet.
841. Bougainvillea glabra *Choisy.*
Bankuli Tea Estate, etc., 1,500—2,000 feet, in gardens cult.

XCI.—AMARANTACEÆ.

842. Deeringia celosioides *R. Br.*
843. Celosia argentea *Linn.*
Jaspur, 1,500—2,000 feet, common.
Vern.—Siliari. Leaves eaten as a *sāg* (vegetable).
844. Celosia cristata *Linn.*
845. Allmania nodiflora *R. Br.*
846. Digera arvensis *Forsk.*
847. Amarantus spinosus *Linn.*
848. Amarantus paniculatus *Linn.*
849. Amarantus caudatus *Linn.*
850. Amarantus gangeticus *Linn.*
851. Amarantus margostanus *Linn.*
852. Amarantus viridis *Linn.*
853. Amarantus Blitum *Linn.* *Var.* oleraceus.
(Species of Amarantus are largely cultivated in stations and villages by natives as potherbs.
Vern.—Sāg, Lal Sāg, etc.)
854. Pupalia atropurpurea *Moq.*
855. Ærua scandens *Wall.*
856. Ærua lanata *Juss.*
Chatra, 1,000—1,500 feet; Sirguja, 1,500—2,000 feet, by roadsides and in cultivated and waste ground.
Vern.—Jărka bariāri.
857. Ærua Monsonia *Mart.*
858. Achyranthes aspera *Linn.*
Chatra, 1,000—1,500 feet; Jaspur, 1,500—2,000 feet; very common (and annoying) in waste places.
Vern.—Chinchiri; Tirchiti.
Var. porphyristachya.
Parasnath.
859. Achyranthes bidentata *Bl.*
860. Alternanthera sessilis *R. Br.*
Pochra, Toree Pergunnah, 500—1,000 feet; Jaspur 2,000—2,500 feet.
861. Gomphrena globosa *Linn.*

XCII.—CHENOPODIACEÆ.

862. Chenopodium album *Linn.*
863. Beta, vulgaris *Linn.*
All stations, 500—2,000 feet, cult. in gardens.
Beet, *Eng.*

864. Spinacia oleracea *Linn.*
All stations, 500—2,000 feet, cult. in gardens.
Spinach, *Eng.*

865. Basella rubra *Linn.*
Sillee, 500—1,000 feet, common, cult. on village garden fences.
Vern.—Chota Pũi Sāg.

XCIII.—POLYGONACEÆ.

866. Polygonum plebejum *R. Br.*
Etkuri, 1,000—1,500 feet.

867. Polygonum limbatum *Meisn.*

868. Polygonum glabrum *Willd.*
Gunia, Toree Pergunnah, in running water, 1,000—1,500 feet; Tirla-nadi, 2,000—2,500 feet; Lohardugga dist., 1,500—2,000 feet.
Vern.—Hŭrra pota; Manj; Măchli-ka-manj. A water-plant; used as a fish-poison.

869. Polygonum stagninum *Ham.*

870. Polygonum barbatum *Linn.*
Gunia, Toree Pergunnah, common in running water, 1,000—1,500 feet; Bandgaon, 2,000—2,500 feet; Jaspur, 2,000—2,500 feet, in a stream-bed.
Vern.—Mangar leta (Jaspur). A water or marsh-plant.

871. Polygonum hydropiper *Linn.*

872. Polygonum alatum *Ham.*
Parasnath.

873. Polygonum capitatum *Ham.*
Parasnath.

874. Polygonum chinense *Linn.*
Parasnath.

875. Rumex dentatus *Linn.*
Kewătbar, 1,000—1,500 feet.

876. Antigonon leptopus *Endl.*
Most stations, 500—2,000 feet; cult. in gardens.

XCIV.—ARISTOLOCHIACEÆ.

877. Aristolochia bracteata *Retz.*
(Aristolochia labiosa, cult. in gardens, Ranchi.)

XCV.—PIPERACEÆ.

878. Piper longum *Linn.*
Palandu Tea Estate, 1,500—2,000 feet cult. *Cooke.*

879. Piper Betle *Linn.*
Cult.
Vern.—Pān.
880. Peperomia reflexa *Dietr.*
Parasnath.

XCVI.—LAURINEÆ.

881. Litsæa sebifera *Pers.*
Dorunda, 1,500—2,000 feet.
882. Litsæa polyantha *Juss.*
883. Litsæa nitida *Roxb.*
Chyebassa, 500 feet, *Haines.*
884. Cassytha filiformis *Linn.*
Santalia (Campbell & Watt).
Vern.—Alag jāri *Santal.* (Another *Alag jāri* is *Cuscuta chinensis* Lamk.)

XCVII.—LORANTHACEÆ.

885. Loranthus scurrula *Linn.*
Ranchi, 1,500—2,000 feet, not so common as *L. longiflorus;* Jaspur, 1,500—2,000 feet; Kochang, 2,000—2,500 feet growing on *Woodfordia floribunda* Salisb.
Vern.—Dawai banda (Banda = parasite = slave).
886. Loranthus cordifolius *Wall.*
887. Loranthus longiflorus *Desrouss.*
Pitorea, West hill, 2,000—2,500 feet; Ranchi, 1,500—2,000 feet.
Vern.—Banda. Very common on Mango trees throughout Chutia Nagpur; has handsome clusters of orange flowers. (Banda is a general term for Loranthaceous plants.)
888. Loranthus globosus *Roxb.*
889. Viscum monoicum *Roxb.*
Pitorea, East hill 2,000—2,500 feet.
Vern.—Pet chamra banda *Santal.* A mistletoe.
890. Viscum orientale *Willd.*
Lunkta, Hazaribagh, 1,000—1,500 feet.
Vern.—Banda *Santal*, Kol, *Hind.* A mistletoe.
891. Viscum articulatum *Burm.*
Kurwāndi Res., Palamow, 1,000—1,500 feet, *Gamble;* Rāke 500—1,000 feet. A mistletoe, flowers white.

XCVIII.—SANTALACEÆ.

892. Santalum album *Linn.*

XCIX.—EUPHORBIACEÆ.

893. Euphorbia hypericifolia *Linn.*

894. Euphorbia pilulifera *Linn.*

Jaspurnagar, 2,000—2,500 feet; Sirguja, 1,500—2,000 feet; in open pasture land; Dorunda, 1,500—2,000 feet; a garden weed.

Vern.—Du-dudhia.

895. Euphorbia thymifolia *Burm.*

Ranchi, 1,500—2,000 feet.

896. Euphorbia microphylla *Heyne.*

Santalia.

Vern.—Dudhia phul

897. Euphorbia Tirucalli *Linn.*

898. Euphorbia neriifolia *Linn.*

899. Euphorbia Nivulia *Ham.*

900. Euphorbia antiquorum *Linn.*

901. Euphorbia dracunculoides *Lamk.*

Jaspur, 2,000—2,500 feet.

Vern.—Chota Brahmini.

902. Euphorbia prolifera *Ham.*

Jaspur, 2,000—2,500 feet, on cultivated ground.

Vern.—Hūrhūria. Juice milky.

[Not in herb., Calcutta from Chutia Nagpur.)

903. Euphorbia pulcherrima *Willd.*

Stations, 500—2,500 feet cult.

Adjutant's Hedge, *Eng.*

904. Bridelia retusa *Spreng.*

Tirla nadi, 2,000—2,500 feet; Pitorea East hill, 2,000—2,500 feet; Jaspur, 1,500—2,000 feet; Thanakatarki, Sirguja, 1,500—2,000 feet.

Vern.—Kawj, kăsăi or kasei,? kari. A tree, 30—40 feet high; berries white. Root astringent.

905. Bridelia montana *Willd.*

Parasnath.

906. Bridelia stipularis *Bl.*

907. Bridelia tomentosa *Bl.*

Ranchi, 1,500—2,000 feet; Dorunda, 1,500—2,000 feet; cult.; fruit eaten.

908. Cleistanthus collinus *Benth.*
Vern.—Kargalli *Santal.*
909. Sauropus quadrangularis *Muell.-Arg.*
910. Phyllanthus reticulatus *Poir.*
911. Phyllanthus Emblica *Linn.*
Palamow, 1,000—1,500 feet; Jaspur, 2,000—2,500 feet; Dorunda, 1,500—2,000 feet. Cult. also common in jungle.
Vern.—Amla, ămra or aoṇla. The Embelic merobalan of commerce. Fruit, size of a gooseberry, pickled, and used in tanning.
912. Phyllanthus Lawii *Grah.*
913. Phyllanthus urinaria *Linn.*
Jabra, Hazaribagh, 1,500—2,000 feet, in moist places by rice fields.
914. Phyllanthus simplex *Retz.*
915. Phyllanthus pendulus *Roxb.*
Ranchi, 1,500—2,000 feet.
[There is no specimen of this in Herb., Calcutta.]
916. Phyllanthus Niruri *Linn.*
Jaspur, 2,000—2,500 feet; common.
Vern.—Băn-jīran or jīran-băn or Arjuni (possibly Arguni).—*J. J. W.*
917. Phyllanthus debilis *Ham.*
918. Glochidion multiloculare *Muell.-Arg.*
919. Glochidion lanceolarium *Dalz.*
Ranch, 1,500—2000ft.; Jaspur, 2,000—2,500 feet.
Vern,—Chĭkni. A shrub, 10—15 feet high. Used by potters (kūmār) in pottery (in what way is doubtful).—*J. J. W.*
920. Glochidion velutinum *Wight.*
921. Flueggia microcarpa *Bl.*
Baragaon, 2,000—2,500 feet; Dorunda garden, 1,500—2,000 feet.
Vern.—Bakleri. A straggling shrub.
922. Breynia-rhamnoides *Muell.-Arg.*
Vern.—Kadrupala, karki *Santal.*
923. Putranjiva Roxburghii *Wall.*
Vern.—Pitaj *Santal*
924. Bischofia javanica *Bl.*
925. Antidesma Ghæsembilla *Gærtn.*
Vern.—Umtoa (Hazaribagh), Mata sure *Kol.* (Watt.)

926. Antidesma Bunius *Spreng.*
Jaspur, 2,000—2,500 feet; on low hills in scrub jungle.
Vern.—Matha.
927. Antidesma diandrum *Roth.*
Băragaon, 2,000—2,500 feet; at the base of Marang Būrū or Băragai Hill.
Vern.—Mŭttŭr Sāg.
928. Antidesma acuminatum *Wall.*
929. Jatropha gossypifolia *Linn.*
Ranchi, 1,500—2,000 feet. A roadside weed, common.
930. Jatropha multifida *Linn.*
Ranchi, etc., 1,500—2,000 feet, cult.
931. Jatropha Curcas *Linn.*
Stations, etc., 500—2,000 feet, common, cult. in gardens.
Vern.—Berenda. Poison-Physic or Purging-nut, *Eng.*
932. Croton oblongifolius *Roxb.*
Latéhar, Palamow, 1,000—1,500 feet; the commonest shrub in the jungles.
Vern.—Pūtri.
933. Croton caudatus *Geisel.*
933A. Croton Tiglium *Linn.*
934. Codiæum variegatum *Bl.*
Stations, 500—2,000 feet; cult. as foliage plants.
935. Chrozophora plicata *A. Juss.*
Santalia (Campbell & Watt).
Vern.—Pangs nari *Santal.*
936. Mallotus repanda *Muell.-Arg.*
937. Mallotus philippinensis *Muell.-Arg.*
Pitorea, East Hill, 2,000—2,500 feet; Sirguja.
Vern.—Rori.
938. Ricinus communis *Linn.*
Cult. in fields throughout Chutia Nagpur as an oil seed.
Vern.—Rēri, (=Rhendi).
Castor-oil plant, *Eng.*
939. Homonoia riparia *Lour.*
Tirla nadi, 2,000—2,500 feet; Jaspur.
Vern.—Cheŭr. A shrub-like a willow, frequent in water-courses.
940. Gelonium multiflorum *A. Juss.*
941. Baliospermum axillare *Bl.*
Mumka-Palamow road, 1,500—2,000 feet.
942. Tragia involucrata *Linn.*
943. Sebastiana Chamælea *Muell.-Arg.*

C.—URTICACEÆ.

944. Holoptelea integrifolia *Planch.*
Hupwa outpost and elsewhere in Hazaribagh district, 1,500—2,000 feet.
Vern.—Chiryta. A large tree very like a beech; leaves wavy, entire; seed two-winged.

945. Trema orientalis *Bl.*
Jonha 1,500—2,000 feet; Jaspur, 1,500—2,000 feet.
Leaves used to polish wood.

946. Trema amboinensis *Bl.*
Ranchi, 1,500—2,000 feet.

947. Trema politoria *Planch.*

948. Cannabis sativa *Linn.*
Villages, up to 2,000 feet; Cult. (? frequently) in fields. Dried plant sold in bazars. Bang—the form used, also Churrus.
Vern.—Gānja.
Hemp, *Eng.*

949. Streblus asper *Lour.*
Santalia (Campbell & Watt).
Vern.—Sahra *Santal.*

950. Morus lævigata *Wall.*
Dorunda Garden, 1,500—2,000 feet; Palandu, 1,500—2,000 feet; *Cooke;* cult.
Vern.—Toont. Fruit purple, cylindric, eaten.

951. Ficus gibbosa *Bl.*—*var.* parasitica.

952. Ficus bengalensis *Linn.*
Here and there throughout Chutia Nagpur.
Vern.—Bar (Burr).

953. Ficus tomentosa *Roxb.*

954. Ficus Benjamina *Linn.*—*var.* comosa.

955. Ficus retusa *Linn.*—*var.* nitida.
Pitorea, East Hill, 2,000—2,500 feet; Chyebassa 500—1,000 feet.
Vern.—Buru hesa *Ho;* Bowr.

956. Ficus nervosa *Roth.*

957. Ficus Rumphii *Bl.*

958. Ficus religiosa *Linn.*

959. Ficus Arnottiana *Miq.*

960. Ficus infectoria *Roxb.*—*var.* Lambertiana.

961. Ficus hispida *Linn. f.*
Old garden, Pitorea, 2,000—2,500 feet.
Vern.—Dūmăr, Porho.
962. Ficus Cunia *Ham.*
Kurughat, Ranchi, probably planted.
Vern.—Dūmbăr.
963. Ficus scandens. *Roxb.*
Santalia (Campbell & Watt); Parasnath (Hooker).
Vern.—Madhur lata *Santal.*
964. Ficus Roxburghii *Wall.*
Kochang, Singbhum district, 2,000—2,500 feet.
965. Ficus glomerata *Roxb.*
Santalia (Campbell & Watt).
Vern.—Loa *Santal.*
966. Artocarpus integrifolia *Linn. f.*
Stations and villages, cult. common.
Vern.—Kătăl. The Jack-fruit tree.
967. Artocarpus Lakoocha *Roxb.*
968. Girardinia zeylanica *Dcne.*
969. Bœhmeria platyphylla *Don.*—*var* scabrella.
970. Pouzolzia indica *Gaud.*
971. Pouzolzia auriculata *Wight.*
972. Pouzolzia pentandra *Burm.*
Sirguja, Bisrampur coal field, 1,500—2,000 feet.
973. Pouzolzia hirta *Hassk.*

CI.—SALICINEÆ.

974. Salix tetrasperma *Roxb.*
Kudia Lotwa Tea Estate, 1,500—2,000 feet; Singbhum, 500—1,000 feet.

CII.—CERATOPHYLLEÆ.

975. Ceratophyllum demersum *Linn.*

CIII.—CONIFERÆ.

976. Pinus longifolia *Roxb.*
Dorunda, 1,500—2,000 feet, cult.
A tree; reaches 40 feet or so in height in Dorunda.

CIV.—HYDROCHARIDEÆ.

977. Hydrilla verticillata *Casp.*
Sirguja, 1,500—2,000 feet, in water.

978. Lagarosiphon Roxburghii *Benth.*
979. Vallisneria spiralis *Linn.*
980. Blyxa Roxburghii *Rich.*
981. Blyxa oryzetorum *Hook. f.*
982. Ottelia alismoides *Pers.*
Sirguja, 2,000—2,500 feet; Pertabpur, 1,500—2000 feet in tanks.
Vern.—Jălkumi.

CV.—BURMANNIACEÆ.

983. Burmannia cœlestis *Don.*

CVI.—ORCHIDEÆ.

984. Microstylis congesta *Reichb. f.*
985. Oberonia iridifolia *Lindl.*? [Not yet seen in flower.]
986. Oberonia Falconeri *Hook. f.*
987. Dendrobium herbaceum *Lindl.*
988. Dendrobium formosum *Roxb.*
989. Dendrobium bicameratam *Lindl.*
990. Dendrobium crepidatum *Lindl.*
991. Dendrobium macrostachyum *Lindl.*
Sillee, 1,000 feet.
992. Dendrobium calceolaria *Corey.*
993. Dendrobium transparens *Wall.*
994. Dendrobium regium *Prain.*
995. Bulbophyllum triste *Reichb. f.*
996. Eria flava *Hook.*
997. Pachystoma senile *Reichb. f.*
998. Phajus Wallichii *Lindl.*
999. Pholidota imbricata *Lindl.*
1000. Eulophia nuda *Lindl.*
1001. Geodorum dilatatum *R. Br.*
1002. Luisia trichorhiza *Bl.*
1003. Rhynchostylis retusa *Bl.*
1004. Ærides multiflorum *Roxb.*
Hindibili, Sandi-mandi waterfall, 1,000—1,5000 feet.
1005. Ærides odoratum *Lindl.*
1006. Vanda parviflora *Lindl.*
1007. Vanda Roxburghii *R. Br.*
Sirguja, 1,500—2,000 feet; Palandu, 1,500—2,000 feet.
Vern.—Banda.
1008. Saccolabium præmorsum *Hook. f.*
1009. Sarcanthus insectifer *Reichb. f.*

1010. Vanilla planifolia *Andr.*
Palandu Tea Estate, 1,500—2,000 feet; cult. *Cooke.*
(Mr. Cooke says that it develops pods.)
1011. Zeuxine sulcata *Lindl.*
1012. Acanthephippium sp. [flowers not yet seen].
1013. Goodyera procera *R. Br.*
1014. Habenaria stenopetala *Lindl.*
1015. Habenaria plantaginea *Lindl.*
1016. Habenaria triflora *Don.*
1017. Habenaria Susannæ *R. Br.*
Chandua-mandu Road, Tooree, 1,000—1,500 feet.
Vern.—? Saida.
1018. Habenaria commelinifolia *Wall.*
1019. Habenaria platyphylla *Spreng.*
Jonha, 1,000—1,500 feet.
[Not in Herb., Calcutta, from Chutia Nagpur.]
1020. Habenari affinis *Wight.*
1021. Habenaria marginata *Colebr.*
1022. Habenaria diphylla *Dalz.*
1023. Habenaria goodyerioides *Don.*
1024. Habenaria Lawii *Hook. f.*
1025. Habenaria Galeandra *Benth.*

CVII.—SCITAMINEÆ.

1026. Globba orixensis *Roxb.*
Banda-Tantar, 500—1,000 feet.
1027. Globba ophioglossa *Wight.*
Parasnath, 2,500 feet.
1028. Globba bulbifera *Roxb.*
1029. Kæmpferia rotunda *Linn.*
1030. Gastrochilus longiflora *Wall.*
1831. Hedychium coronarium *Kæn.*
Jonha, 1,000—1,500 feet.
Vern.—Saida. Flowers white, sweet-scented.
1032. Hedychium coccineum *Hom.*
Mārang-buru, or Bāragai hill, 4,000 feet.
Flowers, scarlet-crimson. Not elewhere met with.—*J. J. W.*
[Not in Herb., Calcutta, from Chuttia Nagpur].*

*[Mārang-Buru, (the Great mountain) is also the Santal national deity, propitiated, according to Sir W. W. Hunter, by sacrifices involving bloodshed or by offerings of *red* flowers. Is the unexpected existence of *H. coccineum* in Chutia Nagpur, and its apparent restriction to Bārgagai, to be explained by deleberate introduction by Santhals?—*Ed. Records.*]

1033. Curcuma aromatica *Salisb.*
1034. Curcuma Zedoaria *Roscoe.*
1035. Curcuma cæsia *Roxb.*
1036. Curcuma Amada *Roxb.*
1037. Curcuma longa *Linn.*
Parasnath, 4,000—5,000 feet.
Vern.—Haldi.
Turmeric, *Eng.*
1038. Curcuma reclinata *Roxb.*
1039. Curcuma petiolata *Roxb.*
Jaspur, 2,000—2,500 feet.
Vern.—Saru'ga.
[Not in Herb., Calcutta, from Chutia Nagpur.]
1040. Amomum dealbatum *Roxb.*
1041. Zingiber rubens *Roxb.*
1042. Zingiber officinale *Roscoe.*
Bankuli Tea Estate, 1,500—2,000 feet; cult,
1042A. Zingiber Zerumbet *Sm.*
1043. Zingiber Casumunar *Roxb.*
Sirguja, 1,500—2,000 feet, banks of Govind river.
Vern.—Paro.
1044. Zingiber capitatum *Roxb.*
Ranchi, 1,500—2,000 feet.
1045. Costus speciosus *Linn.*
Jaspur.
1046. Alpinia Galanga *Sw.*
1047. Phrynium capitatum *Willd.*
1048. Maranta arundinacea *Linn.*
Most stations, 5,00—2,000 feet; cult.
Arrowroot, *Eng.* (Eleven varieties cult. at Palandu Tea Estste, *Cooke.*)
1049. Canna indica *Linn.* var. orientalis.
1050. Musa ornata *Roxb.*
Singbhum, *Haines.*
1051. Musa sapientum *Linn.*
Parasnath, wild. Cult. occasionally.

CVIII.—HÆMODORACEÆ.

1052. Sanseviera Roxburghiana *Schult.*
Palandu, 1,500—2,000 feet; cult.

CIX.—IRIDEÆ.

1053. Belamcanda chinensis *Leman.*

CX.—AMARYLLIDEÆ.

1054. Hypoxis aurea *Lour.*
Baragaon, 2,000—3,000 feet.
1055. Curculigo orchioides *Gærtn.*
Baragaon, 2,000—3,000 feet.
1056. Curculigo recurvata *Dryand.*
Jaspur, 2,000—2,500 feet; Sirguja, 1,500—2,000 feet.
Vern.—Kawa Kandu (=Crow Root); Ban Piaj (=Wild onion).
1057. Zephyranthes tubispatha *Herb.*
Palandu. Cult.
1058. Crinum defixum *Ker.*
1059. Crinum latifolium *Linn.*
1060. Pancratium biflorum *Roxb.*
1061. Agave Cantula *Roxb.*
Cult. for fibre at Hazaribagh Jail and elsewhere.
1062. Agave rigida *Linn.—var.* Sisalana.
Cult. Palandu. Plants poled in 11th year, one plant had over 3,000 bulbils, sold at 2 annas each. *Cooke.*

CXI.—TACCACEÆ.

1063. Tacca pinnatifida *Forst.*

CXII.—DIOSCOREACEÆ.

1064. Dioscorea dæmona *Roxb.*
1065. Dioscorea pentaphylla *Roxb.*
1066. Dioscorea anguina *Roxb.*
1067. Dioscorea glabra *Roxb.*
Jaspur, 1,500—2,000 feet; Kochang, 2,000—2,500 feet.
Vern.—Bān-āru (=wild potato); Āru. A yam. Root eaten.
1068. Dioscorea belophylla *Voigt.*
1069. Dioscorea globosa *Roxb.*
Cult. generally; three varieties.
1070. Dioscorea Wallichii *Hook f.*
1071. Dioscorea Hookeri *Prain.*
1072. Dioscorea Hamiltonii *Hook f.*
1073. Dioscorea sativa *Linn.* (D. bulbifera.)
Jaspur, 2,000—2,500 feet; Sirguja, 1,500—2,500 feet.
Vern.—Ghenti kandu, Ghenti. Root eaten.
Var. crispata.
Jonha, 1,000—1,500 feet.
1074. Dioscorea alata *Linn.*

CXIII.—LILIACEÆ.

1075. Smilax zeylanica *Linn.*
Sirguja, 1,500—2,000 feet.
Vern.—Sher or shere.
[Not in Herb., Calcutta from Chutia Nagpūr.]

1076. Smilax macrophylla *Roxb.*
Baragaon, 2,000—2,500 feet; Jaspur, 2,000—2,500 feet.
Vern.—Rām dātun; Jungli āru, Ran puwan. Root eaten.

1077. Smilax Roxburghiana *Wall.*

1078. Smilax prolifera *Roxb.*

1079. Asparagus racemosus *Willd.*
Jaspur, 2,000—2,500 feet.
Vern.—Sătwār. Wild asparagus. A cooling medicine.

1080. Tupistra aurantiaca *Wall.*
Sirguja, 1,500—2,000 feet.
[Not in Herb, Calcutta; from Chutia Nagpur.]

1081. Hemerocallis fulva *Linn.*
Cult.

1082. Cordyline terminalis *Kunth.*
In gardens, cult.

1083. Asphodelus tenuifolius *Cav.*

1084. Chlorophytum arundinaceum *Bak.*
Jaspur, 2,000—2,500 feet; Sirguja, 1,500—2,000 feet.
Vern.—Kăndri.

1085. Allium Cepa *Linn.*
Cult.
Vern.—Piāj.
Onion, *Eng.*

1086. Scilla indica *Bak.*

1087. Iphigenia indica *Kunth.*
Vern.—Chutia Chandbol *Santal.*

1088. Gloriosa superba *Linn.*
Baragaon; Dorunda, 2,000—3,000 feet.

1089. Yucca aloifolia *Linn.*
Ranchi, cult.

1090. Disporum pullum *Salisb.*

CXIV.—PONTEDERIACEÆ.

1091. Monochoria hastæfolia *Presl.*
Seetagarha Tea Estate, 2,000 feet; growing in water flowing from rice-fields.

1092. Monochoria vaginalis *Presl.*—*var.* plantaginea.

CXV.—XYRIDEÆ.

1093. Xyris pauciflora *Willd.*

CXVI.—COMMELINACEÆ.

1094. Commelina nudiflora *Linn.*
1095. Commelina salicifolia *Roxb.*
Ranchi, 1,500—2,000 feet.
1096. Commelina Hasskarlii *Clarke.*
1097. Commelina bengalensis *Linn.*
Jaspur, 2,000—2,500 feet.
Vern.—Kena.
1098. Commelina attenuata *Kœn.*
1099. Commelina obliqua *Ham.*
1100. Commelina suffruticosa *Bl.*
1101. Aneilema scapiflorum *Wight.*
1102. Aneilema lineolatum *Kunth.*
1103. Aneilema spiratum *R. Br.*
1104. Aneilema nudiflorum *R. Br.*
Sillee, 500—1,000 feet.
1105. Aneilema Hamiltonianum *Wall.*
1106. Aneilema vaginatum *R. Br.*
1107. Cyanotis cristata *Schult. f.*
Pitorea, 2,000—2,500 feet; Kochang, 2,000—2,500 feet.
1108. Cyanotis tuberosa *Schult. f. var.* adscendens.
1109. Cyanotis axillaris *Rœm. & Schult.*
Jonha-Sandi-mandi road, 1,000—1,500 feet; Pertabpur. Sirguja, 1,500—2,000 feet; on banks of a tank. Flowers blue.
1110. Floscopa scandens *Lour.*
Sirguja, 1,500—2,000 feet; roots in water.

CXVII.—PALMEÆ.

1111. Areca Catechu *Linn.*
Cult. 500 feet and upwards; not common on the plateau level, 2,000 feet and upwards.
Vern.—Sopari.
1112. Phœnix sylvestris *Roxb.*
Palamow, 1,000—2,000 feet.
Vern.—Kājūr. Sometimes tapped for sugar, etc.

1113. Phœnix acaulis *Ham.*

Jaspur, 2,000—2,500 feet ; common in jungles.

Vern.—Băn Kăjur. Coarse floor mats commonly made of the leaves. [This species is very common along the eastern edge of the Chutia Nagpur plateau and is, we believe, the *only* dwarf *Prœnix* that occurs in the province.—*Ed. Records*].

1114. Phœnix humilis *Royle. Var.* typica.

"At Chota Nagpore, *Cal. Ouseley* " (F. B. I.). (? cult. in the Commissioner's compound where, *fide* Peppé, a Sago-Palm and other palms occur, planted. Cal. (? Col) Ouseley was Commissioner of Chutia Nagpur before Dalton.—(*J.J.W.*) [Phœnix Ouseleyana *Griff.*, which is this plant, was described by Griffith *from an Assam specimen.*]

1115. Phœnix robusta *Hook f.*

Parasnath.

1116. Calamus viminalis *Willd.*

1117. Metroxylon Sagus *Willd.*

Cult. in Commissioner's compound, Ranchi.

[No specimen in Herb., Calcutta from Chutia Nagpur.]

1118. Borassus flabellifer *Linn.*

Ranchi, 1,500—2,000 feet ; frequent by villages and in lapsed jungle. Not *here* tapped for Toddy.

Vern.—Tāl, Tār. Toddy Palm ; Fan Palm. Palmyra Palm. *Eng.*

1119. Cocos nucifera *Linn.*

Cult ; *not* frequent ; grown, perhaps as a curiosity, not for its fruit.

Cocoanut Palm.

CXVIII.—PANDANEÆ.

1120. Pandanus fascicularis *Linn.*

Ranchi lake, 1,500—2,200 feet.

Vern.—Keora.

EXIX.—AROIDEÆ.

1121. Cryptocoryne ciliata *Fisch.*

1122. Cryptrocoryne retrospiralis *Kunth.*

1123. Cryptocoryne spiralis *Fisch.*

1124. Pistia stratiotes *Linn.*

1125. Arisæma tortuosum *Schott.*

1126. Sauromotum guttatum *Schott.*
Palandu Tea Estate, 1,500—2,000 feet.
1127. Typhonium trilobatum *Schott.*
1128. Amorphophallus campanulatus *Bl.*
1129. Amorphophallus bulbifer *Bl.*
1130. Plesmonium margaritiferum *Schott.*
1131. Remusatia vivipara *Scohtt.*
Parasnath.
1132. Colocasia antiquorum *Schott.*
1133. Colocasia nympheæfolia *Kunth.*
1134. Alocasia indica *Schott.*
Cult.
Vern.—Man Kutchu.
1135. Alocasia macrorhiza, *Schott.*
1136. Alocasia fornicata *Schott.*
1137. Scindapsus officinalis *Schott.*
1138. Lasia heterophylla *Schott.*
Santalia (Campbell & Watt.)

CXX.—LEMNACEÆ.

1139. Lemna paucicostata *Hegelm.*
1140. Wulfia arhiza *Winm.*

CXXI.—ALISMACEÆ.

1141. Alisma reniforme *Don.*
Sirguja.
1142. Sagittaria sagittifolia *Linn.*
Sirguja, banks of the Rer river.
1143. Butomopsis lanceolata *Kunth.*
Jaspur, in moist places. Flowers white.

CXXII.—NAIADACEÆ.

1144. Aponogeton monostachyum *Linn. f.*
1145. Potamogeton indicus *Roxb.*
Pochra, Toree pergunnah 1,000—1,500 feet; in a tank.
Chyebassa, 500—1,000 feet; abundant in tanks.
1146. Potamogeton crispus *Linn.*
Sirguja, 1,500—2,000 feet; in running water, in a small tributary of the Rer river.
1147. Potamogeton mucronatus *Presl.*
Chyebassa tank.
[Not in Herb., Calcutta from Chutia Nagpur].

1148. Naias graminea *Del*
1149. Naias minor *All.*

CXXIII.—ERIOCAULEÆ.

1150. Eriocaulon Sieboldianum *Zucc.*
1151. Eriocaulon truncatum *Ham.*
1152. Eriocaulon oryzetorum *Mart.*
1153. Eriocaulon luzulæfolium *Mart.*
Jabra, Hazaribagh, 1,500—2,000 feet; common in rice-fields and moist places.
1154. Eriocaulon quinqueangulare *Linn.*
1155. Eriocaulon trilobum *Ham.*
1156. Eriocaulon xeranthemum *Mart.*

CXXIV.—CYPERACEÆ.

1157. Kyllinga triceps *Rottb.*
1158. Kyllinga monocephala *Rottb.*
Jaspur 1,500—2,000 feet.
Vern.—Mosha ghas.
1159. Kyllinga brevifolia *Rottb.*
Dorunda, 1,500—2,000 feet.
1160. Kyllinga cylindrica *Nees.*
Parasnath.
1161. Pycreus latespicatus *C. B. Clarke.*
1162. Pycreus nitens *Nees.*
1163. Pycreus capillaris *Nees.*
1164. Juncellus pygmæus *C. B. Clarke.*
1165. Juncellus lævigatus *C. B. Clarke.*
Jaspur, 1,500—2,000 feet.
[Not in Herb., Calcutta, from Chutia Nagpur.]
1166. Cyperus amabilis *Vahl.*
1167. Cyperus cuspidatus *H. B. K.*
1168. Cyperus difformis *Linn.*
1169. Cyperus flavidus *Retz.*
1170. Cyperus compressus *Linn.*
1171. Cyperus aristatus *Rottb.*
1172. Cyperus Iria *Linn.*
1173. Cyperus nutans *Vahl.*
1174. Cyperus pilosus *Vahl.*
1175. Cyperus tegetum *Roxb.*
1176. Cyperus rotundus *Linn.*

1177. Cyperus exaltatus *Retz.*

Jaspur, 2,000—2,500 feet; in wet places near streams.
Vern.—Năgăr Mota.

1178. Mariscus microcephalus *Presl.*

1179. Courtoisia cyperoides *Nees.*

1180. Eleocharis plantaginea *R. Br.*

1181. Eleocharis fistulosa *Schult.*

Pertabpur, Sirguja, 1,500—2,000 feet; in a tank.
Vern.—Linei.

1182. Eleocharis congesta *Don.*

1183. Fimbristylis tetragona *R. Br.*

1184. Fimbristylis schœnoides *Vahl.*

1185. Fimbristylis dipsacea *Benth.*

1186. Fimbristylis squarrosa *Vahl.*

1187. Fimbristylis dichotoma *Vahl.*

1188. Fimbristylis diphylla *Vahl.*

Jaspurnagar, 2,000—2,500 feet; Sitonga, Jaspur, 2,000—2,500 feet; Sirguja, 1,500—2,000 feet; on wet ground and in moist jungle.
Vern.—Khăksi ban = Ban khăksi; Sísuban, Chūnki.

1189. Fimbristylis æstivalis *Vahl.*

1190. Fimbristylis podocarpa *Nees.*

1091. Fimbristylis ferruginea *Vahl.*

Jaspur, 1,500—1,200 feet; in wet fields.
Vern.—Bhainsa ban.

1192. Fimbristylis Hookeriana *Bœck.*

1193. Fimbristylis quinqueangularis *Kunth.*

1194. Fimbristylis miliacea *Vahl.*

1195. Fimbristylis Thomsonii *Bœck.*

1196. Fimbristylis monostachya *Hassk.*

1197. Bulbostylis barbata *Kunth.*

1198. Scirpus supinus *Linn.*

Palamow, 1,000—1,500 feet.

1199. Scirpus erectus *Poir.*

1120. Scirpus articulatus *Linn.*

1201. Scirpus mucronatus *Linn.*

1202. Scirpus grossus *Linn. f.*

Sirguja, 1,500—2,000 feet; a rush, on moist ground
Var. Kysoor.
Manbhum, 1,500—2,000 feet.

1203. Scirpus kyllingioides *Bœck.*

1204. Scirpus Michelianus *Linn.*
1205. Scirpus Isolepis *Bœck.*
1206. Scirpus squarrosus *Linn.*
1207. Fuirena glomerata *Lamk.*
1208. Fuirena umbellata *Rottb.*
1209. Lipocarpha argentea *R. Br.*
1210. Lipocarpha sphacelata *Kunth.*
Sirguja, 1,500—2,000 feet.
1211. Scleria pergracilis *Kunth.*
1212. Scleria lithosperma *Sw.*
1213. Scleria tesselata *Willd.*
1214. Scleria hebecarpa *Nees.*
1215. Carex cruciata *Wahl. Var.* nagpurensis.
1216. Carex stramentitia *Boott.*
1217. Carex plebeja *C. B. Clarke.*
1218. Carex speciosa *Kunth.*

CXXV.—GRAMINEÆ.

1219. Paspalum scrobiculatum *Linn.*
Sirguja, 2,000—2,500 feet; a wayside grass.
Vern.—Kodo; used as a food-grain.
1220. Digitaria sanguinalis *Lamk var.* ciliare.
Ranchi, 1,500—2,000 feet.
1221. Digitaria longiflora *Rets.*
1222. Digitaria Royleana *Nees.*
1223. Digitaria pedicilliaris *Trin.*
1224. Eriochloa polystachya *H. B. K.*
1225. Isachne australis *R.Br.*
1226. Panicum Isachne *Roth.*
1227. Panicum flavidum *Retz.*
1228. Panicum punctatum *Burm.*
1229. Panicum Crus-Galli *Linn.*
1230. Panicum colonum *Linn.*
Ranchi, 1,500—2,000 feet; Jaspurnagar, 2,000—2,500 feet; Sirguja in wet rice fields.
Vern.—Bur'ndo ghas, Dhowra. A food-grain.
1231. Panicum prostratum *Lamk.*
1232. Panicum ramosum *Linn.*
Vern.—Diota Gundli *Santal.*
1233. Panicum distachyum *Linn.*
Nari ghas *Santal.*
1234. Panicum myurus *H. B. K.*

1235. Panicum indicum *Linn.*
Kachang, Singbhum, 2,000—2,500 feet.
1236. Panicum myosuroides *R. Br.*
1237. Panicum miliaceum *Linn.*
Mahretta Tea Estate, Hazaribagh, 2,000—2,500 feet.
1238. Panicum miliare *Lamk.*
Cult.
Vern.—Gundli *Santal.*
1239. Panicum psilopodium *Trin.*
1240. Panicum trypheron *Schult.*
1241. Panicum humile *Nees.*
1242. Panicum maximum *Jacq.*
Daladili Tea Estate, west of Ranchi, 1,500—2,500 feet; cult. as a fodder-grass.
Guinea grass *Eng.*
1243. Panicum repens *Linn.*
1244. Panicum proliferum *Linn.*
1245. Panicum antidotale *Retz.*
Ranchi plateau, 2,000 feet; Sitonga, Jaspur, 2,000—2,500 feet; Sirguja, 1,500—2,000 feet; in fields, cult.
Vern.—Bendi (=Benri); Bērē; Misiri. A food-grain.
[Not in Herb., Calcutta from Chutia-Nagpur.]
1246. Panicum montanum *Roxb.*
Hill near Pitorea, 2,000—2,500 feet.
1247. Panicum plicatum *Lamk.*
1248. Panicum rhachitrichum.
A species of Panicum, a food-grain,
Vern.—Gŭngai, wascollected at Chyebassa, 500—1,000 feet.
1249. Thysanolæna agrostis *Nees.*
1250. Axonopus semialatus *Hook. f.*
1251. Axonopus cimicinus *Beauv.*
1252. Oplismenus compositus *Beauv.*
East Hill, Pitorea.
1253. Oplismenus Burmanni *Beauv.*
1254. Setaria italica *Beauv.*
1255. Setaria glauca *Beauv.*
Baragaon, 2,000—2,500 feet.
1256. Setaria intermedia *Rœm. & Schult.*
1257. Setaria verticillata *Beauv.*
Chatra, Hazaribagh, 1,000—1,500 feet; Mahretta Tea Estate, 2,000—2,500 feet.

1258. Arundinella setosa *Trin.*
Santalia.
Vern.—Bur lukui ghas *Santal.*
1259. Arundinella tenella *Nees.*
1260. Arundinella Wallichii *Nees.*
1261. Pennisetum typhoideum *Rich.*
1262. Pennisetum parviflorum *Trin.*
Hazaribagh 1,500—2,000 feet.
1263. Pennisetum orientale *Rich.*
Parasnath.
1264. Pennisetum pedicellatum *Trin.*
Biras, Hazaribagh.
1265. Pennisetum cenchroides *Rich.*
Black Rocks, Ranchi, 1,500—2,000 feet; Loro, Jaspur 1,500—2,000—feet (Loro village below Hetghat = below the ghat; the *top* of the ghat is 2,000—2,500 feet).
Vern.—Ludia băn.
1266. Oryza sativa *Linn.*
1267. Oryza granulata *Nees.*
1268. Leersia hexandra *Sw.*
1269. Perotis latifolia *Ait.*
1270. Coix Lachryma-Jobi *Linn.*
Nawa tand, 1,500—2,000 feet.
Var. gigantea *Stapf.*
Sitonga, Jaspur, 2,000—2,500.
Vern.—Gŭr-gŭr.
Job's Tears *Eng.*
1271. Polytoca barbata *Stapf.*
1272. Zea Mays *Linn.*
Most cultivated in Toree Pergunnah, Lohardugga.
Vern.—Măkai, Bhŭta.
1273. Hygrorhiza aristata *Nees.*
1274. Leersia hexandra *Sw.*
1275. Garnotia stricta *Brogn.*
Parasnath.
1276. Imperata cylindrica *Cyrill.*
1277. Saccharum spontaneum *Linn.*
1278. Saccharum arundinaceum *Retz.*
1279. Saccharum Narenga *Ham.*
Jaspur, 1,500—2,000 feet.
Arrow-shafts of the Korwas made of this grass. (Korwas = Korewah of V. Ball.)

1280. Saccharum officinarum *Linn.*
Cult. frequently.
1281. Erianthus fastigiatus *Nees.*
1282. Pollinia articulata *Trin.*
1283. Pollinia argentea *Trin.*
1284. Pollinia ciliata *Trin.*
1285. Dimeria ornithopoda *Trin.*
1286. Dimeria connivens *Hack.*
1287. Pogonatherum saccharoideum *Beauv.*
Chama, Lohardugga dist., 1,000—1,500 feet.
1288. Apocopis Wightii *Nees.*
Hazaribagh, 2,000 feet *Clarke.*
1289. Arthraxon lanceolatus *Hochst.*
Parasnath, 4,000 feet.
1290. Arthraxon ciliaris *Beauv.*
1291. Arthraxon microphyllus *Hochst.*
1292. Rottbœllia compressa *Linn. f.*
1293. Rottbœllia Clarkei *Hack.*
1294. Rottbœllia exaltata *Linn f.*
1295. Mnesithea lævis *Kunth* (*Rottbœllia perforata* Roxb.)
1296. Manisuris granularis *Linn. f.*
1297. Ischæmum rugosum *Salisb.*
1298. Ischæmum angustifolium *Hack.*
1299. Ischæmum ciliare *Retz.*
Jaspurnagar, 2,000—2,500 feet; in wet rice fields.
Vern.—Bhūrūndi bān.
1300. Ischæmum hirtum *Hack.*
1301. Ischæmum laxum *R. Br.*
1302. Andropogon brevifolius *Sw.*
1303. Andropogon exilis *Hochst.*
1304. Andropogon fastigiatus *Sw.*
1305. Andropogon foveolatus *Del.*
1306. Andropogon pertusus *Willd.*
1307. Andropogon intermedius *R. Br.*
1308. Andropogon fascicularis *Roxb.*
1309. Andropogon micranthus *Kunth.* *Var.* villosula.
Parasnath.
1310. Andropogon assimilis *Steud.*
Parasnath, 4,000 feet.
1311. Andropogon halepensis *Brot.*
1312. Andropogon Sorghum *Brot.*

1313. Andropogon serratus *Thunb.*
Jaspur, 1,500—2,000 feet.
Vern.—Phūl-bărhi. Brooms are made of it.
1314. Andropogon aciculatus *Retz.*
1315. Andropogon lancearius *Hook. f.*
Ramghar ghat, 1,750 feet *Clarke.*
1316. Andropogon monticola *Schult. var* Trinii.
Jaspurnagar, 2,000—2,500 feet.
Vern.—Ghora ghans. It is said '*not* to flower.'
1317. Andropogon polyphyllus *Hack.*
1318. Andropogon squarrosus *Linn. f.*
Vern.—Sirom *Santal.* Khus-Khus.
1319. Andropogon Gryllus *Linn.*
Sitonga, Jaspur, 2,000—2,500 feet.
Vern.—Dhori-băn.
[Not in Herb., Calcutta, from Chutia Nagpur.]
1320. Andropogon caricosus *Linn.*
1321. Andropogon annulatus *Sw.*
1322. Andropogon Clarkei *Hack.*
1323. Andropogon contortus *Linn.*
1324. Andropogon Schœnanthus *Linn. Var.* versicolor.
Jaspur, 1,500—2,000 feet.
Vern.—Rātā-ban ; Nundia Dushi ghas *Santal.* Geranium grass. Rusa oil grass.
1325. Andropogon citriodorus DC. (? *Schœnanthui* Linn.) J.J.W.
Jaspur, 2,000—2,500 feet.
Vern.—Barando Kher, Băra Kher ghas, Lemon Grass.
1326. Iseilema Wightii *Anderss.*
Sirguja 1,500—2,000 feet Leaves with a blue purple bloom.
1327. Anthistiria imberbis *Retz.*
1328. Anthistiria ciliata *Linn. f.*
1329. Anthistiria gigantea *Cav. Var.* caudata.
1330. Apluda varia *Hack.* subsp. aristata.
Gunia, 1,000—1,500 feet ; by side of nulla in sal jungle.
1331. Aristida Cumingiana *Trin & Rupr.*
Jaspur, 2,000—2,500 feet.
Vern.—Lūd Lūdi băn.
1332. Aristida adscenscionis *Linn.*
1333. Aristida setacea *Retz.*
1334. Aristida redacta *Stapf.*
1335. Sporbolus diander *Beauv.*
Ranchi, 1,500—2,000 feet ; Jaspur ; Dorunda.
Vern.—Bherendi.

1336. Sporobolus indicus *R. Br.*
1337. Coelachne pulchella *R. Br. Var.* spicata.
1338. Polypogon monspeliensis *Desf.*
1339. Avena sativa *Linn.*
Little if at all cultivated by natives.
1340. Microchloa setacea *R. Br.*
1341. Cynodon dactylon *Pers.*
Jaspur, Baghicha village, 1,500—2,000 feet.
Vern.—Dhūb ghas. Found near villages only.
1342. Chloris pallida *Hook. f.*
1343. Chloris delicatula *Clarke.*
Mandu, Hazaribagh, 1,500—2,000 feet *Clarke*
1344. Chloris virgata *Sw.*
1345. Chloris barbata *Sw.*
1346. Tripogon capillatus *Jaub. & Spach.*
Parasnath.
1347. Eleusine indica *Gærtn.*
Jaspur, 1,500—2,000 feet.
Vern.—Māl māréa.
1348. Eleusine coracana *Gærtn.*
Commonly cult. throughout Chutia Nagpur.
Vern.—Mārūa.
1349. Eleusine ægyptiaca *Desf.*
1350. Leptochloa filiformis *Roem & Schult.*
1351. Leptochloa chinensis *Nees.*
1352. Arundo donax *Linn.*
Sirguja, 1,500—2,000 feet.
A tall grass, 7—8 feet high; in a secluded valley.
1353. Phragmites Karka *Trin.*
1354. Elytrophorus articulatus *Beauv.*
Palamow 1,000—1,500 feet; Jaspurnagar, 2,000—2,500 feet; in wet rice fields.
Vern.—Bhāro Pōchi.
1355. Eragrostis ciliata *Nees.*
1356. Eragrostis coarctata *Staff.*
Dorunda garden, 1,500—2,000 feet; a weed.
1357. Eragrostis tenelia *Roem & Schult.*
Sirguja, 1,500—2,000 feet.
1358. Eragrostis interrupta *Beauv.*
1359. Eragrostis amabilis *W. & A.*
Jonha Road, 1,500—2,000 feet; Jaspurnagar, 2,000—2,500 feet; Sirguja, 1,500—2,000 feet.
Vern.—Khet kodo.

1360. Eragrostis major *Host.*
Chyebassa, 500 feet.
1361. Eragrostis stenophylla *Hochst.*
Hunterganj, Hazaribagh, 500—1,000 feet; Chakradarpur, Singbhum, 500—1,000 feet.
Vern.—Bŭrni.
1362. Eragrostis gangetica *Steud.*
1363. Eragrostis elongata *Jacq.*
1364. Eragrostis tremula *Hochst.*
Chyebassa.
1365. Eragrostis minor *Host.*
1366. Eragrostis tenuifolia *Hochst.*
1367. Eragrostis pilosa *Beauv.*
1368. Eragrostis cynosuroides *Beauv.*
1369. Eragrostis nardoides *Trin.*
1370. Eragrostis coromandeliana *Trin.*
1371. Triticum vulgare *Vill.*
Not much cultivated iu Chutia Nagpur.
Vern.—Géhun. Wheat.
1372. Hordeum vulgare *Linn.*
Cultivated.
Vern.—Jow. Barley.
1373. Bambusa vulgaris *Schrad,*
1374. Bambusa arundinacea *Willd.*
1375. Dendrocalamus strictus *Nees.*
Baragaon, 2,000—3,000 feet; Palamow, 1,000 feet; Rhotas Garh.
Vern.—Bans. Bamboo.
1376. Dendrocalamus sericeus *Munro.*
Parasnath.
1377. Cephalostachyum pergracile *Munro.*

CXXVI—FILICES.

1378. Gleichenia dichotoma *Willd.*
1379. Alsophila glabra *Hook.*
1380. Davallia immersa *Wall.*
1381. Davallia pulchra *Don.*
1382. Adiantum lunulatum *Burm*
Jaspur, 2,000—2,500 feet; by rocky streams in moist places.
Vern.—Bhūi nim (1).
1383 Adiantum caudatum *Linn.*

1384. Cheilanthes tenuifolia *Sw.*
Jaspur, 1,500—2,500 feet; in *Sāl* jungle.
Vern.—Pătăl chalta (1); Bhūi nīm (2).
1385. Cheilanthes farinosa *Kaulf.*
Jaspur.
Vern.—Pătăl chalta (2).
Silver Fern. *Eng.*
1386. Pteris longifolia *Linn.*
1387. Pteris pellucida *Presl.*
1388. Pteris biaurita *Linn.*
1389. Ceratopteris thalictroides *Brogn.*
Pertabpur, Sirguja, 1,500—2,000 feet; in moist soil near tanks.
1390. Blechnum orientale *Linn.*
1391. Asplenium laciniatum *Don. Var.* depauperata.
1392. Asplenium drepanophyllum *Bak.*
Sitonga, Jaspur, 2,000—2,500 feet.
Vern.—Chūnki.
1393. Asplenium Filix-fœmina *Bernh.*
1394. Asplenium esculentum *Presl.*
1395. Actinopteris radiata *Link.*
1396. Nephrodium falcilobum *Hook.*
1397. Nephrodium cochleatum *Don.*
Sirguja, 2,000—2,500 feet.
1398. Nephrodium odoratum *Bak.*
1399. Nephrodium unitum *R. Br.*
Sirguja, 1,500—2,000 feet.
1400. Nephrodium truncatum *Presl.*
Sirguja, 1,500—2,000 feet.
1401. Nephrodium aridum *Hook. & Bak.*
1402. Nephrodium molle *Desv.*
1403. Nephrodium variolosum *Hook. & Bak.*
Sirguja, 2,000—2,500 feet.
1404. Nephrodium cicutarium *Hook. & Bak.*
1405. Polypodium proliferum *Roxb.*
Sirguja, 1,500—2,000 feet; Palandu, near Ranchi, 1,500—2,000 feet.
1406. Polypodium multilineatum *Wall.*
1407. Polypodium adnascens *Sw.*
1408. Polypodium stigmosum *Sw.*
1409. Polypodium simplex *Sw.*
1410. Polypodium membranaceum *Don.*
1411. Hemionitis cordata *Roxb.*

1412. Lygodium flexuosum *Sw.*
Jaspur, 2,000—2,500 feet.
1413. Angioptetis evecta *Hoffm.*
1414. Ophioglossum vulgatum *Linn.*
Sirguja.
1415. Ophioglossum reticulatum *Linn.*

CXXVII.—EQUISETACEÆ.

1416. Equisetum debile *Roxb.*
Jaspur, 1,500—2,000 feet; in rice-fields.
Vern.—Năr jōri.

CXXVIII.—LYCOPODIACEÆ.

1417. Lycopodium Hamiltonii *Spreng.*
1418. Selaginella proniflora *Bak.*
Sirguja, 1,500—2,000 feet.
1419. Selaginella pentagona *Spreng.*
1420. Selaginella rupestris *Spreng.*
Jaspar, 1,5000—2,000 feet; common.
Vern.—Chăpka.

CXXIX.—SALVINIACEÆ.

1421. Salvinia cucullata *Roxb.*
1422. Azolla pinnata *R. Br.*

CXXX.—MARSILIACEÆ.

1423. Marsilea quadrifoliata *Linn.*
Jaspurnagar, 2,000—2,500 feet; in rice-fields, moist-ground.
Vern.—Sūn Sūnia.
1424. Marsilea minnta *Linn.*
Balomatti, Toree Pergunnah, 10,00—1,5000 feet; in rice-fields, after crop is cut. Leaves eaten as a sāg or vegetable, *not* the roots.

CXXXI.—MUSCI.

(One or more undetermined species of mosses in Sirguja 1,500—2,000 feet; on banks near small streams.)

CXXXII.—LICHENES.

(An undetermined species found in Sirguja or Jaspur, 1,000—1,500 feet, along with fungus on a decayed branch.

CXXXIII.—FUNGI.

1425. Geaster *sp.*
Sirguja, 1,500—2,000 feet; on or immediately beneath surface of soil in open scrub jungle: pretty plentiful in places.
Vern.—Rūgūra.

1426. Polyporus *sp.*
Sirguja, 1,500—2,000 feet.

1427. Dædalea *sp.*
Sirguja, 1,500—2,000 feet.

(Another species of Fungi was collected in Sirguja, 1,500—2,000 feet, along with Lichen on a decayed branch; still another (*vern.* Kūkri) was obtained at Loro village, Jaspur, 1,500—2,000 feet, growing on old timber.)

CXXXIV.—CHARACEÆ.

1428. Chara fœtida *A. Br.*
Sirguja, 1,500—2,000 feet, in a small stream.

1429. Chara *sp.* (much broader leaf than *C. fœtida*).
Sirguja, 1,500—2,000 feet.
Vern.—Jhal khari.

CXXXV.—ALGÆ.

1430. Cosmerium Logiense *Biss.*
Santalia.

1431. Tabellaria flocculosa *Kuetz.*
Santalia.

1432. Cymbella cymbiformis *van Heurck. Var.* parva.
Santalia.

1433. Mougeotia immersa *West.*
Santalia.

(An undetermined species of Alga was collected in a small stream in Sirguja.)

APPENDIX TO PLANTS OF CHUTIA NAGPUR.

INDEX OF SANTALI NAMES,

From Campbell and Watt's Catalogue.

Akauna . . . . . Calotropis gigantea *Br.*
Alag jari . . . . . Cassytha filiformis *Linn.*
Alag jari . . . . . Cuscuta chinensis *Lamk.*
Andia dhurup arak . . . Leucas Cephalotes *Spreng.*
Arak jhawar . . . . . Utricularia bifida *Linn.*
Arak kawet . . . . . Abrus precatorius *Linn.*
Arak kudrum . . . . Hibiscus Sabdariffa *Linn.*
Armu . . . . . Bursera serrata *Colebr.*
At . . . . . Zehneria umbellata *Thw.*
Aten . . . . . Combretum decandrum *Roxb.*
Atkir . . . . . Smilax ovalifolia *Roxb.*
Atkuli janum . . . . Argemone mexicana *Linn.*
Atkura . . . . . Wrightia tomentosa *R. & S.*
Atuak . . . . . Terminalia tomentosa *Roxb.*
Ato saug . . . . . Dioscorea glabra *Roxb.*

Bachkom . . . . . Ischæmum angustifolium *Hack.*
Bæphol . . . . . Desmodium polycarpum *DC.*
Baglucha . . . . . Martynia diandra *Gloxine.*
Bahu tuturi . . . . . Vernonia cinerea *Less*
Bajra . . . . . Pennisetum typhoideum *Roxb.*
Bana etka . . . . . Ipomæa turpethum *Br.*
Bana hatak . . . . . Oroxylum indicum *Vent.*
Banda . . . . . Loranthus longiflorus *Desv.*
Banda . . . . . Vanda *sp.* (Roxburghii *Br.*)
Banda . . . . . Viscum orientale *Linn.*
Bando . . . . . Spatholobus Roxburghii *Benth.*
Bang sing . . . . . Artemis parvifolia *Roxb.*
Bania kandhum . . . . Phyllanthus lanceolarius *Muell.*
Barangom . . . . . Glossogyne pinnatifida *DC.*
Barangom . . . . . Vernonia cinerea *Less.*
Bhar bhari . . . . . Ocimum canum *Sims.*
Bare baha . . . . . Pentapetes phœnicia *Linn.*
Bare dare . . . . . Ficus bengalensis *Linn.*
Barge kode baha . . . . Peristrophe bicalyculata *Nees.*
Bariar . . . . . Sida humilis *Willd.*
Barni . . . . . Clerodendron infortunatum *Linn.*
Barsa pakor . . . . . Colebrookia oppositifolia *Linn.*
Baru . . . . . Scleichera trijuga *Willd.*
Belaunja . . . . . Sphæranthus indicus *Linn.*
Bengo nari . . . . . Dioscorea bulbifera *Linn.*

Bereng phul . . . . . Pogonatherum saccharoideum *Beauv.*
Berenjo . . . . . Thevetia neriifolia *Juss.*
Bhadu . . . . . Vitex Negundo *Linn.*
Bhainsa . . . . . Colebrookia oppositifolia *Sm.*
Bharbari . . . . . Ocimum Basilicum *Linn.*
Bharbhari . . . . . Ocimum canum *Sims.*
Bhatua arak . . . . . Chenopodium album *Moq.*
Bhedi achim . . . . . Centipeda orbicularis *Lour.*
Bherenda . . . . . Jatropha Curcas *Linn.*
Bhoga kaskom . . . . Gossypium (arboreum) herbaceum *Linn.*
Bhorkond . . . . . Hymenodictyon excelsum *Wall.*
Bindi muthi . . . . . Fimbristylis junciformis *Kunth.*
Bir athel . . . . . Olax *sp.*
Bir barangom . . . . Glossogyne pinnatifida *DC.*
Bir barangom . . . . Sonchus arvensis *Linn.*
Bir baria . . . . . Sida humilis *Willd.*
Bir but . . . . . Flemingia congesta *Roxb.*
Bir horec . . . . . Atylosia scarabaeoides *Benth*
Bir jhawar . . . . . Desmodium Cephalotes *DC.*
Bir Rana arak . . . . Commelina salicifolia *Linn.*
Bir kaskom . . . . . Hibiscus cancellatus *Roxb.*
Bir kauni . . . . . Setaria verticillata *Beauv.*
Bir kod . . . . . Eugenia caryophyllifolia *Lamk.*
Bir kubet . . . . . Andropogon echioides *Nees.*
Bir lopong arak . . . . Rungia pectinata *Nees.*
Vernonia cinerea *Less.*
Bir malkan . . . . . Atylosia mollis *Benth.*
Bir malla . . . . . Launaea asplenifolia *HK. f.*
Bir moch . . . . . Phaseolus aconitifolius *Jacq.*
Bir moch . . . . . Zornia diphylla *Pers.*
Bir mung . . . . . Phaseolus aconitifolius *Jacq.*
Bir munga . . . . . Dalbergia volubilis *Roxb.*
Bir mutha . . . . . Cyperus niveus *Retz.*
Bir narcha . . . . . Corchorus nov. *sp. Watt.*
Birnju . . . . . Bauhinia *sp.*
Bir saug . . . . . Phaseolus Mungo *Linn.*
Bir sasaug . . . . . Curcuma *sp.*
Bir suraj mukhi . . . . Ionidium suffruticosum *Ging.*
Bir surguja . . . . . Laggera flava *Benth.*
Bod lar nari . . . . . Vitis adnata *Roxb.*
Boi bindi . . . . . Randia dumetorum *Lamk.*
Bokom baha . . . . . Melia Azedarach *Linn.*
Bonga khanti . . . . Clematis nutans *Royle.*
Bonga sarjom . . . . Ventilago calyculata *Tul.*
Bonga taini . . . . . Eulophia *sp.*
Bon kapsi . . . . . Thespesia Lampas *Dalz. & Gibs.*
Buch . . . . . Cordia Myxa *Linn.*
Budhi ghasit . . . . Pavetta indica *Linn.*; *Var.* tomentosa
Budhi ghasit . . . . Callicarpa macrophylla *Vahl.*
Budhi kaskom . . . . Gossypium (arboreum) herbaceum *Linn.*

Budhitilai . . . . . Pavetta indica *Linn.*; *Var.* tomentosa.
Buru asaria . . . . . Capparis horrida *Linn.*
Buru ekasira nari . . . . Flemingia congesta *Roxb.*
Buru kalikom charee . . . Equisetum debile *Roxb.*
Buru lukni ghas . . . . Arundinella *Sp.*
Buru mach kunda . . . . Wrightia tomentosa *R. & S.*
Buru mat . . . . . Dendrocalamus strictus *Nees.*
Buru raher . . . . . Cymopsis psoralioides *DC.*
Bat . . . . . Cicer arietinum *Linn.*

Chaili . . . . . Morinda tinctoria *Roxb.*
Chakaoda arak . . . . Cassia Tora *Linn.*
Champa baha . . . . Ochna squarrosa *Linn.*
Chapot . . . . . } Dalbergia lanceolaria *Linn.*
Chapot siris . . . . . }
Char sira . . . . . Vernonia teres *DC.* *Var.* subsessilis.
Chatni . . . . . Alstonia scholaris *Br.*
Chatom arak . . . . . Marsilea quadrifolia *Linn.*
Chaulia . . . . . Ruellia suffruticosa *Roxb.*
Chauric arak . . . . . Lobelia trigona *Roxb.*
Chero ghas . . . . . Ischæmum augustifolium *Hack.*
Chihut lan . . . . . Spatholobus Roxburghii *Benth.*
Chip Chirit . . . . . Achyranthes aspera *Linn.*
Chorcho . . . . . Casearea tomentosa *Roxb.*
Choto lutur . . . . . Limnophila racemosa *Benth.*
Chuduk bud . . . . . Eugenia Jambolana *Lamk.*
Chutia chandbol . . . . Iphigenia indica *Kunth.*

Dahu . . . . . Artocarpus Lakoocha *Roxb.*
Dak ichak . . . . . Jussiæa suffruticosa *Linn.*
Dak kadur . . . . . Sopubia delphinifolia *G. Don.*
Damka duri . . . . . Plectranthus *Sp.*
Dangra seya . . . . . Premna latifolia *Roxb.*
Dare banki (1) . . . . Vanda Roxburghii *Br.*
Dare banki (2) . . . . Vanda *sp.*; probably Roxburghii *Br.*
Dare dhompo . . . . Leonotis nepetæfolia *Br.*
Dare huter . . . . . Indigofera pulchella *Roxb.*
Dare jhapak . . . . . Scindapsus officinalis *Schott.*
Dare kudrum . . . . Hibiscus cannabinus *Linn.*
Dare murup . . . . . Butea frondosa *Linn.*
Dare orsa . . . . . Commelina suffruticosa *Bl.*
Dedhaori janum . . . . Zizyphus Jujuba *Lamk.*
Dhai . . . . . Tacca pinnatifida *Forst.*
Dhatura . . . . . Datura fastuosa *Linn.*
Dhela . . . . . Alangium Lamarckii *Thw.*
Dhiri jhapak . . . . . Begonia picta *Sm.*
Dhobe ghas . . . . . Cynodon dactylon *Pers.*
Dhurighas . . . . . Apluda varia *Hack.* Sub. sp. aristata *Linn.*
Diku sindur . . . . . Buettneria herbacea *Roxb.*
Dimbu baha . . . . . Ocimum Basilicum *Linn.*
Dodhari (1) . . . . . Adiantum lunulatum *Burm.* *Var.* thyrsiflor

Dodhari (2) . . . . . Cheilanthes tenuifolia *Sw.*
Doka . . . . . Odina Wodier *Roxb.*
Dudhi lota . . . . . Ichnocarpus frutescens *Br.*
Dudhia phul . . . . . Euphorbia Chamæsyce *Linn.*
Dundu kit . . . . . Gardenia turgida *Roxb.*
Durya arak . . . . . Vernonia cinerea *Less.*

Edel . . . . . Bombax malabaricum *DC.*
Enga dhurup arak . . . . Leucas Clarkei *Hk. f.*
Eradom . . . . . Ricinus communis *Linn.*
Erba . . . . . Setaria italica *Kunth.*
Etka . . . . . Mucuna pruriens *DC.*
Etkes . . . . . Euphorbia antiquorum *Linn.*

Gabur . . . . . Acacia Farnesiana *Willd.*
Gada hund baba . . . . Jasminum arborescens *Roxb.*
Gada kalha . . . . . Strobilanthes auriculatus *Nees.*
Gada pachwani . . . . Blumea lacera *DC.*
Gada sigrik (1) . . . . Erythræa Roxburghii *G. Don.*
Gada sigrik (2) . . . . Salix tetrasperma *Roxb.*
Gada terel . . . . . Diospyros montana *Roxb.*
Gaighura . . . . . Polygala chinensis *Linn.*
Gandhari arak . . . . Amarantus gangeticus *Linn.*
Ganga tulsi . . . . . Hyptis suaveolens *Poit.*
Ganjher . . . . . Sterculia villosa *Roxb.*
Garbha gojha . . . . Canthium didymum *Roxb.*
Garundi arak . . . . Alternanthera sessilis *Br.*
Ghangra . . . . . Vigna Catjang *Endl.*
Ghora lidi . . . . . Vitis tomentosa *Heyne.*
Gitil arak . . . . . Leucas mollissima *Bth.*
Gitil ran . . . . . Anisochilus carnosus *Wall.*
Goaguli . . . . . Eriolæna Hookeriana *W. & A.*
Gokhula janum . . . } Hygrophila spinosa *T. Anders.*
Gokhula kanta . . . }
Gom . . . . . Anona reticulata *Linn.*
Gore . . . . . Stephegyne parvifolia *Korth.*
Gote . . . . . Croton oblongifolium *Roxb.*
Gulanj baha . . . . . Plumeria acutifolia *Poit.*
Gundli (1) . . . . . Panicum miliare *Lamk.*
Gundli (2) . . . . . Panicum psilopodium *Trin.*

Handi khandi . . . . Physalis minima *Linn.*
Haranda . . . . . Leea robusta *Roxb.*
Harna pakor . . . . . Strobilanthes auriculatus *Nees.*
Hat . . . . . Holarrhena antidysenterica *Wall.*
Hatkan . . . . . Leea macrophylla *Roxb.*
Hatkan . . . . . Leea robusta *Roxb.*
Hehel . . . . . Millettia auriculata *Baker*
Hende disom horec . . . Glycine Soja *Sieb. & Zucc*
Hesac . . . . . Ficus religiosa *Linn.*
Hesel . . . . . Anogeissus latifolia *Wall.*

Hetmundia . . . . . Trichodesma indicum *Br.*
Hinjor . . . . . Barringtonia acutangula *Gærtn.*
Hodo jereng arak . . . . Cyanotis tuberosa *Roem. & Sch.*
Hopo . . . . . Cochlospermum Gossypium *DC.*
Hor podo . . . . . Ficus Cunia *Buch.*
Horec . . . . . Dolichos biflorus *Linn.*
Hund . . . . . Olax scandens *Roxb.*
Hundro . . . . . Wendlandia exserta *DC.*
Hurhura . . . . . Cleome monophylla *Linn.*

Icer . . . . . Vitis latifolia *Roxb.*
Icewer . . . . . Vitis latifolia *Roxb.*
Ich koie . . . . . Eragrostis tenella *Nees.*
Ichak . . . . . Woodfordia floribunda *Salisb.*
Ichak banda . . . . . Loranthus Scurrula *Linn.*
Ichkoch . . . . . Eragrostis unioloides *R. & S.*
Ilinchin . . . . . Oldenlandia senegalensis *Hiern.*

Jang olak . . . . . Grewia asiatica *Linn.*
Jang siris . . . . . Albizzia odorata *Beath.*
Jang tira . . . . . Pueraria tuberosa *DC.*
Janhe . . . . . Paspalum scrobiculatum *Linn.*
Janhe hirom . . . . . Euphorbia scabrifolia *Kurz.*
Janhe nanjom . . . . Polycarpæa corymbosa *Lamk.*
Jargadi . . . . . Coix Lachryma-Jobi *Linn.*
Janum arak . . . . . Amarantus spinosus *Linn.*
Janum dhompo . . . . Leonotis nepetæfolia *Br.*
Jhawa khandra . . . . Phyllanthus Lawii *J. Grah.*
Jhawar . . . . . Trema amboinensis *Bl.*
Jhimbiriya . . . . . Holmskioldia sanguinea *Retz.*
Jhurjhuri . . . . . Vernonia cinerea *Less.*
Jinjit . . . . . Bauhinia variegata *Linn.*
Jinjit . . . . . Bauhinia retusa *Ham.*
Jioti . . . . . Polygonum glabrum *Willd.*
Jojo . . . . . Tamarindus indica *Linn.*
Jokha sakam . . . . . Sida humilis *Willd.*
Jom janum . . . . . Zizyphus Jujuba *Lamk.*
Jondra . . . . . Zea Mays. *Linn.*
Jugia . . . . . Cordia Macleodii *Hk. f. & T.*

Kada chandi ghas . . . . Andropogon pertusus *Willd.*
Kada met . . . . . Premna herbacea *Roxb.*
Kadam . . . . . Anthocephalus Cadamba *Miq.*
Kadrupala . . . . . Bridelia retusa *Spreng.*
Kadu . . . . . Lagenaria vulgaris *Seringe.*
Kahu buthki . . . . . Bryonia laciniosa *Linn.*
Kalmeg . . . . . Andrographis paniculata *Nees.*
Kanchan arak . . . . . Momordica dioica *Roxb.*
Kanta phul . . . . . Barleria Prionitis *Linn.*
Kanta saru . . . . . Lasia heterophylla *Schott.*
Kanta siris . . . . . Albizzia myriophylla *Benth.*
Kantha arak . . . . . Euphorbia granulata *Forsh.*

Karam . . . . . Adina cordifolia *Hk. f.*
Karanj jhonok ghas . . . Aristida *Sp.*
Kargalli . . . . . Lepedicropsis orbicularis *Muell.*
Kari . . . . . Ericybe paniculata *Roxb.*
Karkat . . . . . Zizyphus Xylopyrus *Willd.*
Karke . . . . . Bridelia retusa *Spreng*
Karmbi arak . . . . . Ipomaea speciosa *R. & S.*
Karsar . . . . . Thysolæna Agrostis *Nees.*
Karwak janum . . . . Carissa Carandas *Linn.*
Kasmar . . . . . Gmelina arborea *Roxb.*
Kat tilsinia . . . . . Sesamum indicum *DC.*
Katik jhunka . . . . . Crotalaria prostrata *Roxb.*
Katkom junga . . . . Viscum attenuatum *DC.*
Kauha . . . . . Terminalia Arjuna *Bedd.*
Kedar jhawar . . . . Cleome monophylla *Linn.*
Kedar nari . . . . . Asparagus *sp.*
Kedok arak . . . . . Argyreia speciosa *Sweet*
Kesari . . . . . Lathyrus sativus *Linn.*
Khaiyar . . . . . Acacia Catechu *Willd.*
Kharbari . . . . . Clerodendron infortunatum *Linn.*
Khijur . . . . . Phœnix sylvestris *Roxb.*
Koch Bel . . . . . Feronia elephantum *Correa.*
Kode . . . . . Eleusine coracanà *Gærtn.*
Kolo . . . . . Vitis lanata *Roxb.*
Kolo nari . . . . . Vitis lanata *Roxb.*
Kome . . . . . Miliusa betulina *H. R. F. & T.*
Konden . . . . . Eriosema chinense *Vogel.*
Kondro janum . . . . Acacia Intsia *Willd.*
Korkot . . . . . Dillenia indica *Linn.*
Kuchla . . . . . Strychnos potatorum *Linn.*
Kujri . . . . . Celastrus paniculatus *Willd.*
Kukra . . . . . Setaria glauca *Beauv.*
Kulai lutur . . . . . Lepidagathis scariosa *Nees.*
Kumbir . . . . . Careya arborea *Roxb.*
Kuri gandhara . . . . Digera arvensis *Forsk.*
Kurit rama . . . . . Zizyphus oxyphylla *Edgew.*
Kuruinj . . . . . Pongamia glabra *Vent.*

Lal kesari . . . . . Eclipta alba *Hassk.*
Larka baha . . . . . Amarantus paniculatus *Miq.*
Layo gundli . . . . . Panicum antidotale *Retz.*
Lenaha . . . . . Pennisetum typhoideum *Rich.*
Lil kathi . . . . . Polygala crotalarioides *Ham.*
Lili bichi . . . . . Indigofera pulchella *Roxb.*
Loa . . . . . Ficus glomerata *Roxb.*
Lodam . . . . . Symplocos racemosa *Roxb.*
Lopong . . . . . Terminalia belerica *Roxb.*
Lopong arak . . . . . Aerua lanata *Linn.*
Lopong herak . . . . Uraria lagopoides *DC.*
Loto . . . . . Randia dumetorum *Lamk.*
Lutni . . . . . Brassica campestris *Linn.*

Machkunda . . . . . Pterospermum acerifolium *Willd.*
Madhur lata . . . . . Ficus scandens *Roxb.*
Makar kenda . . . . . Diospyros Embryopteris *Pers.*
Malhan . . . . . Dolichos Lablab *Linn.*
Mali buha . . . . . Ocimum Basilicum *L. Var.* thyrsiflora.
Mandargom . . . . . Anona squamosa *Linn.*
Marang jhunka . . . . Crotalaria alata *Roxb.*
Marang kongah . . . . Dregia volubilis *Bth.*
Marabha . . . . . Vitex peduncularis *Wall. Var.* Roxburghiana *C. B. Clarke*
Marak . . . . . Erythrina indica *Roxb.*
Motha arak . . . . . Antidesma diandra *Tulas.*
Motha sura . . . . . Terminalia Arjuna *W. & A.*
Mathom arac . . . . . Hygrophila salicifolia *Nees.*
Matkom . . . . . Bassia latifolia *Roxb.*
Meral . . . . . Phyllanthus Emblica *Linn.*
Merlec . . . . . Flacourtia Ramontchi *L'Herit.*
Merom chundri . . . . Cyanotis tuberosa *R. & S.*
Merom met . . . . . Ixora parviflora *Vahl.*
Merom met . . . . . Olax nana *Wall.*
Mihndi . . . . . Lawsonia alba *Linn.*
Miru baha . . . . . Abutilon indicum *Don.*
Moch . . . . . Phaseolus aconitifolius *Jacq.*
Moron arak . . . . . Holostemma Rheedii *Wall.*
Mota bhedi janetel . . . . Urena sinuata *Linn.*
Mota bir jhunka . . . . Crotalaria calycina *Shrank.*
Mota gundli . . . . . Panicum *sp.*
Mota uric alang . . . . Portulaca oleracea *Linn.*
Mung . . . . . Phaseolus Mungo L., *var.* maxima *Roxb.*
Munga arak . . . . . Moringa pterpyosperma *Gærtn.*
Munjur juti . . . . . Elephantopus scaber *Linn.*
Murga . . . . . Pterocarpus Marsupium *Roxb.*
Murup . . . . . Butea frondosa *Linn.*
Mutha . . . . . Cyperus rotundus *Linn*
(Mutha ghas) . . . . . Kyllinga monocephala *Rottb.*

Nanha . . . . . Cheilanthes tenuifolia *Sw.*
Nanhabindi mutha . . . . Thunbergia monostachya *Hassk.*
Nanha bonga charee . . . Panicum *sp.*
Nanha durhi ghas . . . . Andropogon Schœnanthus *Linn.*
Nanha jhunka . . . . Crotalaria prostrata *Roxb.*
Nanha pusi toa . . . . Euphorbia thymifolia *Burm.*
Nari ghas . . . . . Panicum vestitum *Nees.*
Nari murup . . . . . Butea (superba *R.*) frondosa *Roxb.*
Nari siris . . . . . Dalbergia volubilis *Roxb.*
Nuri . . . . . Elaeodendron Roxburghii *W. & A.*
Nurnic . . . . . Cassia Fistula *Linn.*

Ochohic . . . . . Bœrhaavia diffusa *Roxb.*
Ol . . . . . Amorphophallus campanulatus *Blum.*
Olat . . . . . Grewia tiliæfolia *Vahl.*

Olat . . . . . Grewia vestita *Wall.*
Ome . . . . . Miliusa velutina *Hf. & T.*
Oponom . . . . . Angelica glauca *Edgew.*
Orop . . . . . Costus speciosus *Sm.*
Orsorin . . . . . Curcuma *sp.*
Ot kondro . . . . . Cassia mimosoides *Linn.*
Ot poraini . . . . . Ophioglossum vulgatum *Linn.*

Pader . . . . . Stereospermum suaveolens *DC.*
Pango nari . . . . . Chrozophora plicata *A. Juss.*
Panjon . . . . . Polyalthia cerasoides *Benth & Hk.f.*
Panjot . . . . . Clerodendron phlomoides *Linn.f.*
Panjot nari . . . . . Porana paniculata *Roxb.*
Pansinga baha . . . . Dysophylla verticillata *Benth.*
Paror jhinga . . . . . Luffa acutangula *Roxb.*
Parwa cetchirip . . . . Cynoglossum denticulatum *A.DC.*
Parwa jhara . . . . . Euphorbia dracunculoides *Lamk.*
Parwa lata . . . . . Cynoglossum denticulatum *A.DC.*
Patal kohnda . . . . . Pueraria tuberosa *DC.*
Pathu orot . . . . Æginetia indica *Linn.*
Patwa ghas . . . . . Cassia mimosoides *Linn.*
Pet chamra . . . . . Helicteres Isora *Linn.*
Pet chamra banda . . . . Viscum monoicum *Roxb.*
Petrada . . . . . Jussiæa suffruticosa *Linn.*
Pichari baha . . . . . Wendlandia exserta *DC.*
Pinde . . . . . Randia uliginosa *DC.*
Piska . . . . . Dioscorea oppositifolia *Linn.*
Pitoj . . . . . Putranjiva Roxburghii *Wall.*
Pitua arak . . . . . Spermacoce stricta *Linn.*
Pojo . . . . . Tetranthera monopetala *Roxb.*
Pond disom horec . . . . Glycine Soja *Sieb & Zucc.*
Pond gandhari arak . . . Amarantus tristis *Linn.*
Pond kawet . . . . . Abrus precatorius *Linn.*
Pond raj baha . . . . Nerium odorum *Solan.*
Popro . . . . . Gardenia latifolia *Ait.*
Poska olat . . . . . Kydia calycina *Roxb.*
Pusi pan . . . . . Ehretia levis *Roxb.*
Pusi pan . . . . . Heliotropiun strigosum *Willd.*
Pusi toa . . . . . Euphorbia pilulifera *Linn.*
Putki malla . . . . . Cardiospermum Halicacabum *Linn.*

Raher . . . . . Cajanus indicus *Spreng.*
Rai . . . . . Brassica juncea *Hk.f. & T.*
Rai dhani . . . . . Ventilago calyculata *Tul.*
Raila baha . . . . . Barleria *sp.*
Raj baha . . . . . Nerium odorum *Soland.*
Ralli . . . . . Piper longum *Linn.*
Ramra . . . . . Phaseolus Mungo *Linn.* *Var.* radiata.
Rangaini janum . . . . Solanum xanthocarpum *Schrad & Wendl.*
Rani phul . . . . . Polygonum indicum *Heyne.*
Ride . . . . . Casearia tomentosa *Roxb.*

Rol . . . . . Terminalia Chebula *Retz.*
Rondoc . . . . . Blumea Wightiana *DC.*
Rora . . . . . Mallotus philippinensis *Muell.*
Rot . . . . . Ougeinia dalbergioides *Benth.*
Ruhen . . . . . Soymida febrifuga *A. Juss.*

Saguna . . . . . Tectona grandis *Linn.*
Sahra . . . . . Streblus asper *Lour.*
Sakarkenda . . . . . Ipomæa Batatas *Lamk.*
Salga . . . . . Boswellia serrata *Roxb.*
Sama ghas . . . . . Panicum colonum *Linn.*
Sapurom . . . . . Nyctanthes Arbor-tristis *Linn.*
Saram lutur . . . . . Clerodendron serratum *Spreng.*
Sar ghas . . . . . Saccharum arundinaceum *Retz.*
Sarjom . . . . . Shorea robusta *Gærtn.*
Sarparating . . . . . Globba orixensis *Roxb.*
Satsayar . . . . . Dalbergia latifolia *Roxb.*
Sauri arak . . . . . Polygonum glabrum *Willd.*
Sauri ghas . . . . . Andropogon contortus *Linn.*
(Secra) sekra . . . . . Zizyphus rugosus *Lamk.*
Sega janum . . . . . Mimosa rubicaulis *Lamk.*
Sehrec . . . . . Lagerstrœmia parviflora *Roxb.*
Sengel sing . . . . . Tragia involucrata *Linn.*
Serwang . . . . . Vigna vexillata *Benth.*
Seta andir . . . . . Grewia polygama *Roxb.*
Seta kata . . . . . Grewia polygama *Roxb.*
Seta kata arak . . . . . Gynandropsis pentaphylla *Linn.*
Seta pan . . . . . Monochorea *sp.*
Seta pan . . . . . Monochorea plantaginea *Kunth.*
Siknar . . . . . Urena repanda *Roxb.*
Sikyom baha . . . . . Crinum *nov. sp. G. Watt.*
Sim basak . . . . . Flemingia strobilifera *R. Br.*
Sim dœhok . . . . . Cyanotis tuberosa *R. & S.*
Sim mutha sura . . . . . Desmodium latifolium *DC.*
Sindnari . . . . . Vitex Negundo *Linn.*
Sing arak . . . . . Bauhinia purpurea *Linn.*
Sinjo . . . . . Ægle Marmelos *Correa.*
Sirgit arak . . . . . Celosia argentea *Linn.*
Siric samand . . . . . Gloriosa superba *Linn.*
Siris . . . . . Albizzia Lebbek *Benth.*
Sirom . . . . . Andropogon muricatus *Retz.*
So kod . . . . . Eugenia Jambolana *Lamk.*
Son . . . . . Crotalaria juncea *Linn.*
Son jhunka . . . . . striata *DC.*
Soso . . . . . Semecarpus Anacardium *Linn.*
Sunta bukni . . . . . Eleusine ægyptiaca *Desf.*
Sunum jor . . . . . Ficus cordifolia *Roxb.*
Sura . . . . . Cyperus tegetum *Roxb.*
Surgi baha . . . . . Anisomeles ovata *R. Br.*
Surguja . . . . . Guizotia abyssinica *Cass.*
Sutri . . . . . Phaseolus calcaratus *Roxb.*

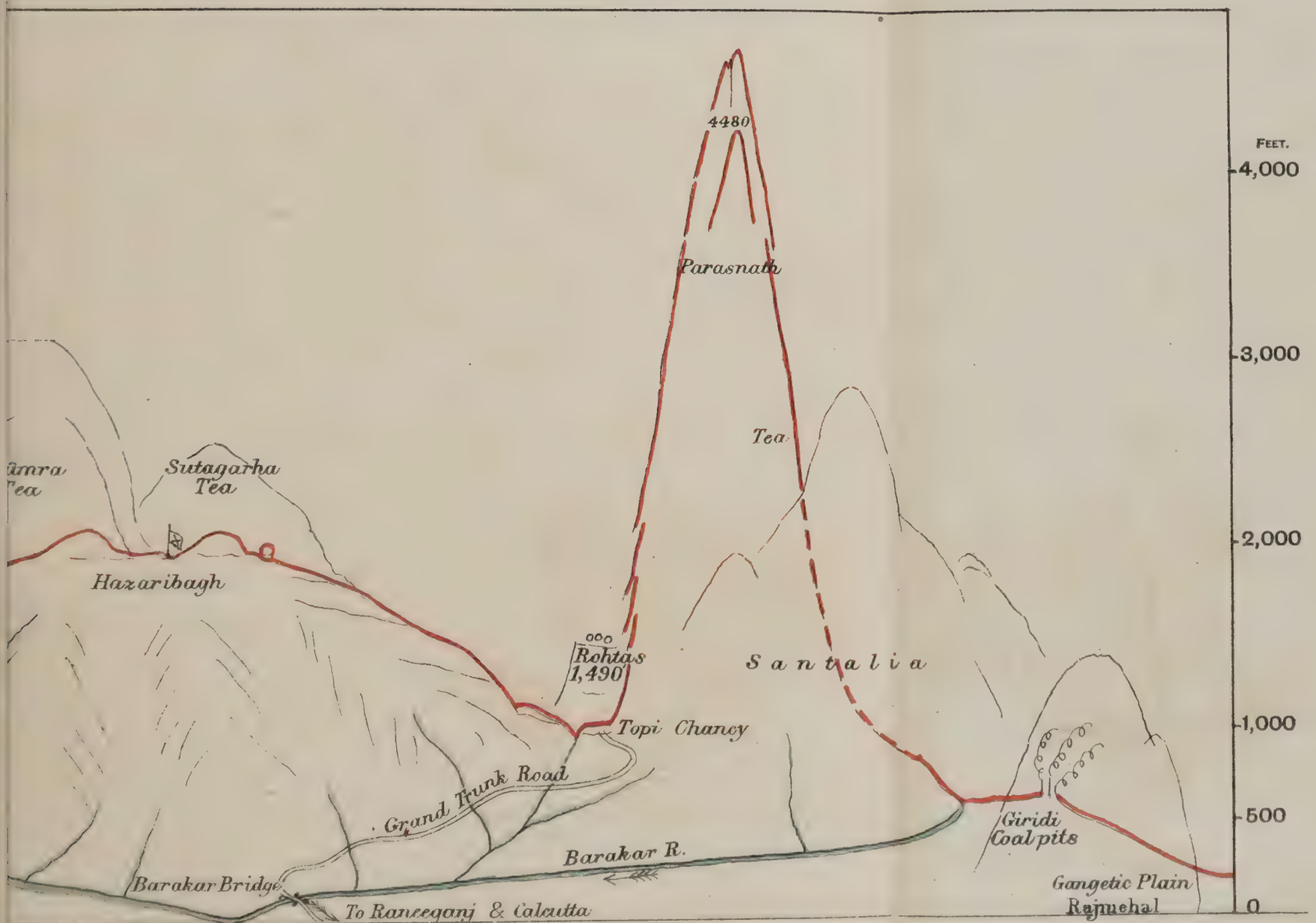
Taben arak . . . . . Desmodium gyrans *DC.*
Tandi bhedi janetel . . . Desmodium gangeticum *DC.*
Tandi chatom arak . . . Desmodium parvifolium *DC.*
Tandi chatmarak . . . . Oxalis corniculatus *Linn.*
Tandi jhapni . . . . . Zornia diphylla *Pers.*
Tandi khode baha . . . . Evolvulus alsinoides *Linn.*
Tandi khode baha . . . . Indigofera linifolia *Retz.*
Tandi meral . . . . . Phyllanthus simplex *Retz.*
Tandi sol . . . . . Ionidium suffruticosum *Ging.*
Tandi sunsuni . . . . Desmodium parvifolium *DC.*
Tandi sura . . . . . Cyperus rotundus *Linn.*
Tarbuj . . . . . Cucumis Melo *Linn.*
Tarse kotap . . . . . Grewia villosa *Willd.*
Tayar baha . . . . . Justicia Betonica *Linn.*
Tejo malla . . . . . Cissampelos Pareira *Linn.*
Telhec . . . . . Sterculia urens *Roxb.*
Terel . . . . . Diospyros (tomentosa *Roxb.*) Embryopteris *Pers.*
Thadia turi . . . . . Brassica campestris *var.* Toria *Linn.*
Thuiak arak . . . . . Melochia corchorifolia *Linn.*
Tihon . . . . . Canavalia ensiformis *DC.*
Tilai . . . . . Wendlandia tinctoria *DC.*
Tilmin . . . . . Sesamum indicum *Linn.*
Tiririte . . . . . Vicia hirsuta *Koch.*
Tirra . . . . . Pueraria tuberosa *DC.*
Torchandbol . . . . . Eragrostis ciliaris *Linn.*
Totonopak . . . . . Eugenia operculata *Roxb.*
Turam . . . . . Oldenlandia senegalensis *Hierw.*
Turi sim . . . . . Orobanche indica *Ham.*

Udal . . . . . Sterculia *sp.* (*G. Watt.*)
Ul . . . . . Mangifera indica *Linn.*
Uri
Uri horo . . . . . } Oryza sativa *Linn.*
Utri dudhi . . . . . Cryptolepis Buchanani *R. & S.*

Varni . . . . . Clerodendron infortunatum *Linn.*

(W :—X :—Y :—Z. No words beginning.)

G. I. C. P. O.—No. 261 R. & A.—1-8-1902.—350.—C. M. W.



and Southerly.

(J.J.W., 1901.)

N.

Litho., S. I. O., Calcutta

A NOTE ON PLANTS USED DURING FAMINES AND SEASONS OF SCARCITY IN THE BOMBAY PRESIDENCY.

By G. A. Gammie.

BY Government of Bombay Resolution No. 5214, dated 25th July 1901, I was instructed to place myself in communication with the Collectors of affected districts in order to procure complete information regarding the plants used for food during times of scarcity and famine. A list is appended of the Collectors and their subordinate officers who generously assisted in the enquiry and to whom my thanks are due.

In many cases the samples submitted were very inadequate and were only to be identified after minute investigation; but, still, the valuable remarks attached to many compensated for the trouble in effecting their determination. The vernacular names are collected with extreme care and as they, in almost all cases, refer to common plants, sufficiently familiar to be selected for food, they can be accepted as correct. The names are localized in the list to illustrate the differences of usage in the various districts. In a few instances and probably by inadvertence, vernacular names and specimens were transposed. There was no difficulty found in correcting mistakes of this description; but, in fewer instances, happily, vernacular names were applied indiscriminately. These, of course, were deleted and are ignored in the list. It must be borne in mind that few of these plants are or could be used exclusively for food. The customary method is to mix them with cereal grains to eke out a scanty stock of the latter and the poorer classes habitually resort to such expedients.

Dr. J. C. Lisboa (Gazetteer, Bombay Presidency, Volume XXV, pp. 190-209) (1886) mentioned "that it is curious to find in many reports written on the subject that plants and vegetables that are eaten all the year round in ordinary times are sometimes included in the lists of famine foods." He also states, with forcible truth, "that it is a difficult task for a single man, however long he may have resided in the country, to obtain an accurate list of all the food grains and vegetables eaten by the natives of India during ordinary seasons and those of scarcity. It is also a fact that even well-to-do natives eat some of the wild herbs found in or about their villages, either as a change or as an addition to the meals or when a supply of good cultivated vegetables is not procurable, and many of them make a point to use, at least once a year, made into *shak baji,* herbs and tubers usually eaten by the humbler classes, whether cultivated or uncultivated, under the belief that such a proceeding assists in warding off various causes of disease."

In my own opinion it is neither politic nor desirable to obtain a complete list of all the plants used in times of stress, as any plant, not absolutely poisonous or repugnant to the taste, will serve, and besides, the self-respecting attitude of the very poor protects them from minute research into the details of their poverty. Another point must also be remembered, and, that is, in an enquiry of this description, the people, from an intense dread of ridicule, will often withhold information regarding even their ordinary articles of diet. A cursory examination of the list will prove that, with very few exceptions, the plants named are palpable makeshifts for more wholesome food and that, even were they subjected to rigid selection under long-continued cultivation, the result would not repay the labour and anxiety entailed.

The Special Civil Officer in charge of famine relief works at Khamgaon Tank, Poona District, remarks: "The poorer classes make use of the grass seeds and green vegetation when they have not sufficient food, but some of the seeds and vegetation being injurious to human health, the workers are not allowed to make use of them. Besides, the price of the common staple food grain, *bajri* not being very heavy during this famine, no necessity compelled them to make use of the seeds, etc. If these latter are not properly cooked and are eaten in too great quantity they tend to produce diarrhœa and dysentery and are, therefore, strictly prohibited from use on this work. The entire use of these and other

grasses and vegetables would not keep human life for a considerable period with safety and health."

The Mamletdar of Sangamner Taluka, Ahmednagar, writes: 'In other seasons the poorer classes collect the seeds of *Ichaka*, *Godadi* and *Kena*, *Kaotha nut* and *Umbar*. The fruits of Prickly Pear too are used by the poorer classes."

Dr. Lisboa remarks (*op. cit.*): "It is a fact that many of the plants in the list given below contain less of nutritive principles and more of woody tissue, gummy and resinous substances and various extractive matters which are neither digestible nor nourishing; they may be palatable to the taste and temporarily appease the cravings of hunger, but their exclusive use for a lengthened period brings on decay and emaciation and renders the constitution an easy prey to disease. This assertion is not based on theory alone. Numerous facts observed during the famines in Orissa, Behar, Madras, and the Southern Mahratha Country, prove that the protracted use of such herbs alone, even "of *taclu*, *muchur*, etc., which are used in ordinary seasons in small quantities along with other food, was followed by emaciation and other symptoms of slow starvation such as *anæmia*, *scurvy*, etc., often proving fatal by inducing diarrhœa, dysentery, dropsy of the whole body, or of the abdomen alone .... besides the plants below mentioned, there are many others which famine-stricken people make use of, in fact, it would appear that they devour whatever more or less tender vegetable substances they come across, provided they are not either very acrid or bitter."

My thanks are due to the Collectors and other duly mentioned officers of the districts from which information was sent to me.

Ahmednagar District—

The Collector.
The Mamletdar of Akola.
" of Ahmednagar.
" of Karjat.
" of Kopargaon.
" of Newasa.
" of Parner.
" of Rahuri.
" of Sangamner.
" of Shevgaon.
" of Shrigonda.

Bijapur District—

The Collector.
The Mamletdar of Badami.
" of Bilgi.
" of Indi.
" of Sindgi.

Broach District—

The Collector.
The Mamletdar of Amod.
" of Anklesvar.
" of Jambusar.
" of Wagra.

Ahmedabad District—

The Collector.
The Mamletdar of Ahmedabad.
" of Gogha.
" of Modasa.
" of Prantij.
" of Viramgaon.

Kaira District—

The District Deputy Collector, Kaira.
The Mamletdar of Anand.
" of Borsad.
" of Kapadvanj.
" of Matar.
" of Mehamadabad.
" of Nariad.
" of Thasra.

Khandesh District—

The Collector.
The Mahalkari of Nawapur.
The Mamletdar of Pimpulner.
" of Shahada.
" of Shirpur.
" of Taloda.

Nasik District—
The Collector.
The Mamletdar of Baglan.
" of Chandor.
" of Dindori.
" of Igatpuri.
" of Kalwan.
" of Malegaon.
" of Nandgaon.
" of Nasik.
" of Niphad.
" of Peint.
" of Sinnar.
" of Yeola.

Panch Mahals—
The Collector.
The Assistant Collector, Godhra.
The District Deputy Collector, Panch Mahals.

Poona District—
The Collector.
The Mamletdar of Junnar.
Special Civil Officer, Khamgaon Tank.
The Mahalkari of Mulshi.
The Mamletdar of Purandhar.
Special Civil Officer, Walha Parincha Road.

Satara District—
The Collector.

Sholapur District—
The Divisional Forest Officer, Sholapur.

Surat District—
The Collector.
The Mamletdar of Bardoli.
The Range Forest Officer, Mandvi.
The Mamletdar of Mandvi.
" of Olpad.
The Range Forest Officer, Dangs.
The Divisional Forest Officer, Surat.
The Mamletdar of Pardi.
The Mahalkari of Valod.

DILLENIACEÆ.

Dillenia pentagyna, Roxb. *Karaola* (Dang, Surat). The flowers and fruits are eaten. This tree flourishes only in the moister parts of the Presidency and its habitats are remote from most areas liable to famine.

ANONACEÆ.

Anona squamosa, Linn. *Sitaphal.* Although this plant has run wild round Deccan villages and maintains its existence on dry rocky soil, its fruit is probably worthless in seasons of drought.

MENISPERMACEÆ.

Cocculus villosus, DC. *Vasu vel* (Taloda, Khandesh). *Dagadi* (Badami, Bijapur). "The leaves are made into *bhaji*." "The root is said to be medicinal."

NYMPHÆACEÆ.

The roots and seeds of **Nymphæa Lotus**, Linn. and **Nymphæa stellata**, Willd. and **Nelumbium speciosum**, Willd. are said to be eaten during periods of scarcity.

CRUCIFERÆ.

Members of this order are rare in the Bombay Presidency, and not one of its species would survive in the absence of rainfall.

CAPPARIDEÆ.

Cleome viscosa, Linn. *Tilwani.* (Poona and Ahmednagar Districts.) *Tilvan* (Yeola, Nasik). Leaves are eaten.

POLYGALEÆ.

Polygala chinensis, Hooker. *Negli.* Leaves eaten. (J. C. Lisboa.)

PORTULACACEÆ.

Portulaca Oleracea, Linn. *Ghol* (Ahmednagar and Nasik Districts). *Gholu* (Sangamner, Ahmednagar). *Ghola* (Satara). *Goli* (Badami, Bijapur). A plentiful weed on waste and cultivated ground. Leaves eaten.

Portulaca quadrifida, Linn. *Chil* (Rahuri, Ahmednagar) *Gholu* (Khamgaon, Tank, Poona). *Chùl ghúl* (Walha Parincha Road, Poona). *Chighal* (Ahmednagar). *Ghol* (Ahmednagar). *Nacha goli* (Indi, Bijapur). Very common

in waste and cultivated ground. "This is a vegetable, the leaves of which are used in preparing bread by mixing with *Bajri* or *Jowari* flour, after being boiled."

Portulaca suffruticosa, Wight. *Morad* (Ahmedabad). Leaves eaten. Plant received from this locality only.

MALVACEÆ.

Abutilon indicum, G. Don. *Kachnia* (Ahmednagar). Seeds eaten.

Abutilon muticum G. Don. *Chakrabenda.* Seeds eaten. (J. C. Lisboa.)

Hibiscus panduræformis, Burms. *Kasli* (Khamgaon Tank, Poona). "Seeds mixed with *Bajri* or *Jowari* grains and made into flour."

Hibiscus tiliacerus, Linn. *Belapata.* Mucilage eaten. (J. C. Lisboa.)

Bombax malabaricum, DC. *Sawar* (Shahada, Khandesh). *Shimla* (Godhra, Panch Mahals). *Savri.* (Taloda, Khandesh). "Young roots from this tree, like *Nim* tree, cut into thin pieces and when mixed with spices and salt, form a good food." "The gum, tender leaves, and flowers are eaten. The root is first roasted over the fire and then the skin is taken off and the contents which are similar to that of sweet potato (*ratali*) are eaten. The leaves are eaten after boiling with condiments. The flowers are first dried and then pounded. The flower is then prepared into bread, either with or without corn."

Eriodendron anfractuosum, DC. *Shameula, Pandhari Savar.* Seeds eaten. (J. C. Lisboa.)

STERCULIACEÆ.

Sterculia urens, Roxb. *Kadhai* (Shahada, Khandesh). "This grows as large as a *Nim* or Babhúl tree. Its tender roots are edible. They are first cut into small pieces, then boiled and mixed with either spices or sugar. The tree further yields a good outturn of seeds of a black colour and as large as gram. It is dried and turned into pulse. Its taste is similar to that of *Masúr.*"

Buettneria herbacea. Roxb. Leaves eaten. (J. C. Lisboa.)

TILIACEÆ.

Grewia populifolia, Vahl. *Tapadi* (Sholapur). Leaves eaten.

Grewia tiliæfolia, Vahl. *Dhaman* (Taloda, Khandesh). *Dhamni* (Dang, Surat). *Rodaga* (Sholapur). "The tender leaves only of this tree are eaten."

Grewia pilosa, Lamk. *Karmati* (Sholapur). Leaves eaten. *Corchorus sp. Rajan* (Panch Mahals). Leaves eaten.

ZYGOPHYLLEÆ.

Tribulus terrestris, Linn. *Sarata* (Universally.) *Gokharu* (Nasik). "Leaves boiled with water and mixed with salt and chillies if available." An abundant and troublesome weed on waste, sandy soils. The fruits are also said to be eaten.

GERANIACEÆ.

Oxalis corniculata, Linn. *Ambusi.* Leaves eaten. A common almost ineradicable weed in moist soils.

RUTACEÆ.

Feronia elephantum, Correa. *Kothi* (Jambusar). Fruits eaten.

Ægle marmelos, Correa. *Bila* (Mandvi, Surat). Fruits eaten.

BURSERACEÆ.

Garuga pinnata, Roxb. *Kaked* (Mandvi, Surat). Leaves and fruits eaten.

MELIACEÆ.

Melia azadirachta, Linn. *Nim* (Mandvi, Surat). Fruits.

RHAMNEÆ.

Zizyphus jujuba, Lamk. *Bordi* (Dang, Surat). *Bor* (Sholapur). Fruits.

SAPINDACEÆ.

Cardiospermum Halicacabum, Linn. *Naphatki.* (J. C. Lisboa.) Leaves and young shoots eaten.

ANACARDIACEÆ.

Rhus mysorensis, Heyne. *Ambonia* (Rahuri, Ahmednagar). *Ambaoni* (Ahmednagar). *Amoni* (Sholapur). Leaves and fruits eaten. "The fruits are used after cooking or roasting on an iron pan."

MORINGEÆ.

Moringa pterygosperma, Gærtn. *Shekta* (Surat). Roots, leaves, flowers and fruits eaten. "Cooked in water and mixed with salt and chillies."

LEGUMINOSÆ.

Rothia trifoliata, Pers. (J. C. Lisboa.) Leaves and pods eaten.

Crotalaria orixensis, Rottb. *Lagad* (Newasa, Ahmednagar) "This plant bears pods which contain red seeds as large as *Bajri*. It is used for bread."

Indigofera linifolia, Retz. *Barbada* (Newasa, Ahmednagar). "The plant is threshed and gives seeds like Italian millet (*Rala*). It is turned into flour for making bread."

Indigofera cordifolia, Heyne. *Godadi* (Universally). *Potre* (Malegaon, Nasik). "Seeds mixed with *Bajri* or *Jowari* grains and made into flour. The plant is removed and threshed. It yields a white seed like opium and it is used for making bread. It thrives on light múrúm soil and on lands lying fallow for a considerable time. It grows with grass at the commencement of the monsoon and is ripe in the month of November. It, also, is threshed like *Vichka* (Cyanotis axillaris) and bread is made of it. It has not a bad taste when it is mixed with *Jowari*, otherwise, it is not palatable. When it is used without mixture of grain, such as *Jowari* or *Bajri*, the body of the eater swells and he is likely to succumb. When it is used after mixing with grain it does not produce any bad effect on one's health. Like *Vichka* it has not the quality of keeping off hunger."

Indigofera glandulosa, Willd. *Divali* (Newasa, Ahmednagar). *Ranmetha* (Kopargaon, Ahmednagar). *Borbada* (Purandhar, Poona). *Pahudi* (Anklesvar, Broach). *Jronju* (Nawapur, Khandesh). *Barbada* (Nandgaon, Nasik). *Peodi* (Mandvi, Surat). *Defri* (Wagra, Broach). "Plants when threshed give reddish seed like Italian millet. It is either boiled as rice or is used for making bread after converting it into flour."

Indigofera linifolia, is common on poor grass lands. The other species mentioned come up in thick beds along river banks and on low lying lands liable to be innundated during heavy showers in the rainy season. Towards the end of September

they stand laden with fruits and the yield of seeds in favourable situations must be very large. From the number of specimens received, it is to be presumed that these *Indigoferas* are of considerable value as food.

Sesbania ægyptiaca, Pers. *Shevri* (J. C. Lisboa). Seeds eaten. A very quickly growing, short lived shrub, also useful for fodder. It will not thrive, however, without water.

Sesbania grandiflora, Pers. *Agthio* (Dang, Surat). Leaves, flowers and young pods are eaten. This is also a quickly growing shrub, much used in *Pan baris.*

Smithia sensitiva, Ait. *Kawale.* (Akola, Ahmednagar). *Kawala.* (Igatpuri, Nasik). Leaves eaten. This and other species of this genus are superabundant on flat low lying lands in the moister parts, and their bright green leaves and sparkling flowers literally carpet large areas.

Alysicarpus rugosus, DC. Seeds eaten. (J.C. Lisboa.) Common in pastures.

Butea frondosa, Roxb. *Khakhar* (Dang, Surat). "Roots toasted and eaten."

Phaseolus trilobus, Ait. *Ranmatki* (Walha Parincha Road, Poona). *Mathan* (Yeola, Nasik). *Mataki* (Sangamner, Ahmednagar). Seeds eaten.

Phaseolus trinervius, Heyne. *Chamdadi* (Walha Parincha Road, Poona) Seeds eaten. Specimens were only received from this locality, but Dr. Lisboa says: "The seeds, said to be rich in nitrogenous principles, were largely used by the famine-stricken people."

Canavalia ensiformis, DC. *Mavi* (Mandvi, Surat). Pods eaten. This cultivated plant often runs wild on village hedge-rows.

Vigna vexillata, Benth. *Chaoli* (Shirpur, Khandesh). *Halgia* (Chandor, Nasik). Tubers eaten. An abundant plant over areas of heavy rainfall, but absent from the drier districts.

Dolichos biflorus, Linn. *Papadi* (Nawapur, Khandesh). "Fruits used as vegetables."

Cassia Fistula, Linn. *Germara* (Mandvi, Surat). No information was supplied regarding the parts eaten.

Cassia occidentalis, Linn. *Thorla tacala.* Leaves eaten. (J. C. Lisboa.)

Cassia Sophera. Linn. *Kashawada* (Poona District). Leaves eaten.

Cassia Tora, Linn. *Tarota* (Universally). *Kasoda* (Rahuri, Ahmednagar). *Takla* (Satara). *Sekto* (Olpad, Surat). "The leaves are used in preparing bread by mixing *Bajri* or *Jowari* flour, after being boiled with water." This plant, in spite of its nauseous odour, is used as a vegetable at ordinary times and, judging from the number of specimens received from many districts, it must form a valuable food adjunct in times of scarcity.

Cassia auriculata, Linn. *Tarwar; Aral.* Leaves eaten. (J. C. Lisboa.) A superabundant plant on dry soils, in flower more or less all the year round. The bark is largely used by native tanners.

Tamarindus indica, Linn. *Chinch*; *Amli* (Universally). *Hanshi* (Bilgi, Bijapur). Leaves and seeds eaten. "Amli is used to mix with Dhúdhda (Arisæma) whilst cooking."

Bauhinia racemosa, Linn. *Asitranaparda* (Bardoli, Surat) *Asintro* (Dang, Surat). *Asitra* (Mandvi, Surat). *Apta* (Generally in Marathi). Seeds eaten. "Dry, grind, and make loaves."

Acacia arabica, Willd. *Babhúl.* Seeds eaten and said to be very deleterious. It is commonly said that only seeds voided by goats when eating the pods germinate readily.

Acacia leucophlæa, Willd. Bark and pods eaten. (J. C. Lisboa.) This tree is common on dry, *múrúm* soils and its branches are usually enlarged and distorted by disease.

CACTEÆ.

Opuntia nigricans Hw. *Nivandga* (Satara). *Hathia Thor* (Jambusar). Fruits eaten. The common prickly pear of Western India and an ineradicable pest in too many localities. It, of course, survives throughout the severest drought, but its phylloclades become very shrivelled, so that its value as a fodder would not be so great as is generally assumed.

COMBRETACEÆ.

Terminalia Belerica, Roxb. *Behedo* (Mandvi, Surat). Fruits eaten.

Terminalia Arjuna, Bedd. *Sadad* (Panch Mahals). Fruits eaten.

MYRTACEÆ.

Eugenia Jambolana, Lamk. *Jambuds* (Dang, Surat). Fruits eaten (probably to a greater extent than in ordinary seasons).

CUCURBITACEÆ.

Cucumis trigonus, Roxb. *Kachla* (Panch Mahals.) Fruits eaten.

Momordica dioica, Roxb. *Kankodan; kantola* (Panch Mahals). Fruits eaten.

Cephalandia indica, Naud. *Tongli* (Malegaon, Nasik). Ripe fruits eaten.

Rhyncocarpa fœtida, Schrad. Fruits and leaves eaten. (J. C. Lisboa.)

FICOIDEÆ.

Trianthema decandra, Linn. *Ghetuli* (Sangamner, Ahmednagar). Leaves eaten.

Trianthema monogyna, Linn. *Ghetuli* (Poona and Ahmednagar). *Vasu* (Ahmednagar). "Leaves boiled with water and mixed with salt and chillies."

Orygia decumbens, Forsk. Leaves eaten. (J. C. Lisboa.)

Gisekia pharnacioides, Linn. Leaves eaten. (J. C. Lisboa.)

UMBELLIFERÆ.

Hydrocotyle asiatica, Linn. *Khoburwali* (Ahmednagar). Leaves eaten. This is the only member of the order

CORNACEÆ.

Alangium Lamarckii, Thw. *Ankol* (Dang, Surat). No note regarding parts eaten was received.

RUBIACEÆ.

Randia uliginosa, DC. *Gengdi* (Bardoli, Surat). *Gengada* (Panch Mahals). "Fruits cooked in water and mixed with salt and chillies."

Randia dumetorum, Lamk. *Gengua* (Surat). Fruits eaten.

Canthium parviflorum, Roxb. *Kar* (Sholapur). Fruits eaten.

COMPOSITÆ.

Eclipta alba, Hassak. *Tandala* (Igatpuri, Nasik). Leaves eaten.

Guizotia abyssinica, Cass. *Khurasni* (Akola, Ahmednagar). Leaves eaten.

Glossocardia linearifolia, Cass. Leaves eaten. (J. C. Lisboa.)

Goniocaulon glabrum, Cass. *Kasmud* (Universally). *Kat kasmad* (Khamgaon Tank, Poona). "Leaves boiled with water and mixed with salt and chillies, if available." This common plant appeared to be one of the most esteemed as famine food.

Sonchus oleraceus, Linn. *Pathari* (Ahmednagar). Leaves eaten. This, although an exceedingly common plant, was only received from one locality.

Launæa pinnatifida, Cass. *Pathuri* (Universally). *Hattarki* (Badami, Bijapur). Leaves eaten. This plant seems to have been extensively used.

Launæa nudicaulis, Less. *Patri* (Walha Parincha Road, Poona). Leaves eaten. Received from one locality only.

CAMPANULACEÆ.

Lobelia trigona, Roxb. *Karakholi* (Igatpuri, Nasik). Leave eaten. Received from this locality alone.

MYRSINEÆ.

Embelia robusta, Gærtn. *Ingali* (Pimpalner, Khandesh). *Ambat ingali* (Igatpuri, Nasik). A common plant in hilly tracts enjoying abundant rainfall. The leaves are probably extensively used.

SAPOTACEÆ.

Bassia latifolia, Roxb. Flowers and fruits. (J. C. Lisboa.)

Bassia longifolia, Linn. Flowers and fruits. (J. C. Lisboa.) "During the famine of 1873-74 at Behar they are said to have kept thousands of people from starvation" (J. C. Lisboa.)

EBENACEÆ.

Diospyros Tupru, Ham. *Timarva* (Panch Mahals). "The pounded bark and fruits eaten."

OLEACEÆ.

Schrebera swietenoides, Roxb. *Mokha* (Surat, Khandesh, and Panch Mahals). "A tree as large as the Mango, the leaves

are made into a *bhaji, i.e.*, they are boiled and eaten, mixed with salt and chillies. The fruit is useless as food."

APOCYNACEÆ.

Carissa Carandas, Linn. *Karwand* (Ahmednagar). Fruits eaten. Specimens from this locality alone; but probably most people look upon it as a shrub providing ordinary diet at its proper season.

ASCLEPIADEÆ.

Dregea volubilis, Benth. *Dodi* (Godhra, Panch Mahals). *Chiri* (Talda, Khandesh). *Phundi* (Ahmednagar). Roots and leaves eaten. "The leaves are eaten as they are or sometimes only boiled before eating. The fruit is also sweet and serves as a good repast. The whole of it is eaten, and it is said to be very nourishing. The flowers are eaten as they are or prepared into a *bhaji*."

Leptadenia reticulata, W. & A. *Harandodi* (Generally). *Dodi* (Ahmed bad). "The leaves are used in preparing bread by mixing *Bajri* or *Jowari* flour, after being boiled with water." This climber, common in hedge rows, was largely utilized.

Ceropegba Bulbosa, Roxb. *Dúdha malida kand* (Shahada, Khandesh). *Malode* (Chandor, Nasik). Tubers and leaves eaten. "The very name, meaning milk and sweetmeat indicates that is a very nutritious food. It is even consumed quite raw. When boiled, it is either mixed with milk and sugar or salt and spices."

Caralluma fimbriata, Wall. *Ranshabar* (Rahuri Taluka, Ahmednagar). *Makad shenguli* (Poona and Satara). *Shindala mukadi* (Nasik and Ahmednagar). "Whole plant boiled with water and mixed with salt and chillies, if available." A tufted, leafless plant, common amongst rocks on barren hills. I have found it very abundant also around some Deccan villages, growing amidst small prickly pear bushes, and altogether absent in the open, so that it is probably browsed upon by cattle.

GENTIANACEÆ.

Limnanthemum cristatum, Griesb. *Khatara*; *Kuma* Stems and fruits eaten. (J. C. Lisboa).

BORAGINEÆ.

Cordia Myxa, Linn. *Bhokri* or *Shelti* (Taloda, Khandesh). *Wadganda* (Dang, Surat). "The leaves are prepared into a *bhaji*. The fruits are sweet and their contents are sticky. These are also commonly eaten."

Cordia Rothii, Roem. & Sch. *Gandi* (Mandvi, Surat). No information received regarding parts eaten.

Ehretia laevis, Roxb. *Tamboli* (Akola, Ahmednagar). "The pounded bark is eaten."

CONVOLVULACEÆ.

Rivea hypocrateriformis, Choisy. *Phang*, *Phangi*, *Phanji*, and *Phandi* (Universally). *Matli* (Indi, Bijapur). *Mastiganto* (Sindgi, Bijapur). "The leaves are used in preparing bread by mixing *Bajri* or *Jowari* flour, after being boiled with water, or they are boiled with condiments, *i.e.*, prepared into a *bhaji*. The fruit is bitter to the taste and not eaten." This is an exceedingly common climber, usually covering Euphorbias and such like small shrubs. Judging from the great number of specimens received it must have been very largely utilized as food.

Ipomæa Batatas, Lamk. *Ratala* (Ahmednagar and Satara). "The leaves are used in preparing bread by mixing with *Bajri* or *Jowari* flour, after being boiled with water."

Ipomæa aquatica, Forsk. *Narini bhaji* (Olpad, Surat). *Nala* (Panch Mahals). Young shoots and leaves eaten.

Ipomæa reniformis, Choisy. *Adki* (Indi, Bijapur). No information received regarding parts used.

Ipomæa eriocarpa, Br. *Halaganaki* (Indi, Bijapur). No information received regarding parts used.

Ipomæa sepiara, Koen. *Aumti*. Leaves eaten. (J. C. Lisboa.)

SOLANACEÆ.

Solanum nigrum, Linn. *Kangwani* (Ahmednagar). Leaves and fruits eaten.

Solanum xanthocarpum, Schrad. & Wendl. *Bhui ringni*. Unripe fruits eaten. (J. C. Lisboa.)

Solanum torvum, Sw. (J. C. Lisboa.)

PEDALINEÆ.

Martynia diandra, Glox. *Khata amba* (Pimpalner, Khandesh). Leaves eaten.

ACANTHACEÆ.

Hygrophila spinosa, T. Anders. *Kolasana* (Igatpuri, Nasik). Leaves eaten.

Hygrophila serphyllum, T. Anders. *Godadi* (Ahmednagar) Leaves eaten.

VERBENACEÆ.

Lantana Camara, Linn. *Tantani.* Fruits eaten. A common plant near villages and on waste ground almost everywhere.

Premna latifolia, Roxb. *Chambari.* Leaves eaten. (J. C. Lisboa.)

Clerodendron serratum, Spreng. *Bharangi* (Ahmednagar and Satara). Leaves eaten.

LABIATÆ.

Ocimum canum, Sims. *Manki* or *Bateria* (Matar, Kaira). *Bavchi* (Kaira and Panch Mahals). "Mixed with grains of Sama." (*Panicum colonum.*) "The seeds are generally mixed with other grains and not eaten by themselves. It is of the same genus as *tulsi.*" (Basil.)

Leucas aspera, Spreng. *Tamba.* Leaves eaten. (J. C. Lisboa.)

NYCTAGINEÆ.

Boerhavia repens, Linn. *Cheduli* (Walha Parincha Road, Poona). *Ghetivali* (Yeola, Nasik). Leaves eaten.

Boerhaavia repanda, Willd. *Pemarnara.* Leaves eaten (J. C. Lisboa.)

AMARANTACEÆ.

Celosia argentea, Linn. *Kurdu* (Universally). *Kundru* (Malegaon, Nasik). *Kunjru* (Pimpalner, Khandesh). *Limdi* (Mandvi, Surat). *Hani* (Badami and Sindgi, Bijapur) *Tambadi* (Modesa, Ahmedabad). "Leaves boiled with water and mixed with salt and chillies." This is a particularly valuable plant as it thrives on high lying *múrúm* soils. In dry districts I have observed it growing so thickly in *bajri* fields as to leave no doubt in my mind that it was really relied upon as a subsidiary crop. By selection it could probably be rapidly improved and stripping the plants of their leaves for *bhaji* does not appear to affect the outturn of seed, which ought also to be valuable for food. A great number of samples of this useful plant was received.

Celosia cristata, Linn. *Garka* (Panch Mahals). Leaves eaten.

Digera arvensis, Forsk. *Kunjur; Kunjari; Kunjira; Kunjra* (Universally). *Kundru* (Malegaon, Nasik). "Plant boiled with water and mixed with salt and chillies if available." This plant was sent from almost every part. It is abundant everywhere during the rainy season and for some time after.

Amarantus spinosus, Linn. *Katla Matla* (Pimpalner, Khandesh). Leaves eaten.

Amarantus paniculatus, Linn. *Rajgira*. Leaves and seeds eaten. Generally cultivated.

Amarantus gangeticus, Linn. *Math* or *Mathla* (Baglan, Nasik). *Gotala matala* (Pimpalner, Khandesh). *Ran math* (Sangamner, Ahmednagar). *Harawi* (Indi, Bijapur). "Boiled in water and mixed with salt and powder of chillies."

Amarantus polygamus, Linn. *Tandulja*, *Tandali* (Generally). *Pandi* (Indi, Bijapur). "Leaves boiled with water and mixed with salt and chillies." *Amarantus* spp. *Lal matala* (Pimpalner, Khandesh). *Pandhra matala* (Pimpalner, Khandesh) *Tandulja* (Sangamner, Ahmednagar). *Kunjursa* (Sangamner, Ahmednagar). These probably belong to one or other of the species already mentioned, but were not in a fit condition to be identified. In ordinary seasons all these species of *Amarantus* are largely collected for food and in times of scarcity they must prove of the utmost value as they grow everywhere.

Ærua lanata, Juss. Leaves used. (J. C. Lisboa).

Achyranthes aspera, Linn. *Aghuda* (Baglan, Nasik). *Aghadia* (Akola, Ahmednagar). *Agarda* (Pimpalner, Khandesh). *Janjeta*, (Mandvi, Surat). "Leaves boiled and eaten, mixed with salt and chillies."

Alternanthera sessilis, Br. Leaves eaten. (J. C. Lisboa.)

CHENOPODIACEÆ.

Chenopodium album, Linn. *Chil* (Poona and Ahmednagar). *Chili* (Sangamner, Ahmednagar). Leaves eaten.

Suæda fruticosa, Forsk. *Moras* (Olpad, Surat). Leaves eaten.

SANTALACEÆ.

Santalum album. Linn. *Chandan*. Seeds eaten.

EUPHARBIACEÆ.

Euphorbia pilulifera, Linn. Leaves eaten. (J. C. Lisboa.) This is a very common weed on waste and cultivated ground, and it flourishes throughout the year. I have no records of its being eaten.

Bridelia retusa, Spreng. *Asan* (Dang, Surat). A characteristic tree of the forests in the areas of heavy rainfall. The fruits are probably used, but no information was received regarding the parts eaten.

Flueggia leucopyrus, *Pithvani* (Ahmednagar). *Pandhra phali* (Sholapur). I believe that the leaves are eaten.

Acalypha indica, Linn. *Khokati.* Leaves eaten. (J. C. Lisboa.) An abundant weed everywhere in the rains. I received no specimens.

URTICACEÆ.

Ficus bengalensis, Linn. *Vad* (Universally). *Vadla* (Panch Mahals). Fruits eaten.

Ficus religiosa, Linn. *Pipardi* (Dang, Surat). Young leaves are eaten.

Ficus tsiela, Roxb. *Pipedi* (Mandvi, Surat). Young leaves are probably eaten.

Ficus infectoria, Roxb. *Pipla* (Mandvi, Surat). Young leaves are probably eaten.

Ficus glomerata, Roxb. *Ambar* (Universally). *Umerda* (Burdoli, Surat). *Guler* (Panch Mahals). "Fruits dried and ground and used for preparing bread with *Bajri* or *Jowari* flour." I believe it is the unripe fruits that are thus made use of. The tree is very abundant in the areas of heavy rainfalls and as it is always more or less loaded with fruit, it is used in ordinary times. It is, however, almost impossible to find any ripe fruit without myriads of little black flies in its interior.

ORCHIDACEÆ.

Eulophia, *sp. Kakad Kaud* (Shahada, Khandesh). "This is a very nutritious tuber, but it is generally used as a medicinal tonic."

SCITAMINEÆ.

Musa superba, Roxb. *Kardai* (Kalwan, Nasik). *Rankele* (Khandesh). *Kawdari* (Nasik and Poona Districts).

"Rhizomes and shoots eaten." "Roots of wild plantains are dried and pounded and then used for bread."

Musa rosacea, Jacq. Rhizomes and shoots eaten. (J. C. Lisboa.)

Musa sapientum, Linn. *Kawadar* (Peint, Nasik and Akola, Ahmednagar). "The stem of the tree which afterwards bears plantains. This is eaten just as it is (raw)."

AMARYLLIDEÆ.

Curculigo orchidioides, Gærtn. *Dholi*; *Masli*; *Kalli* (Panch Mahals). No information received as to parts eaten. *Crinum spp.* Several bulbs, apparently of this genus, were received, but I could not identify them. They are common in rivers everywhere.

Agave americana, Linn. (J. C. Lisboa.)

Agave lantula, Roxb. (J. C. Lisboa.) No samples were sent to me.

DIOSCOREACEÆ.

Dioscorea pentaphylla, Linn. *Chai*; *Chavi* (Commonly). *Alshi* (Baglan, Nasik). *Kala kand* (Shahada, Khandesh). *Jaglia che kand* (Shirpur, Khandesh). *Vaj no kand* (Mandvi, Surat). *Kadu kand* (Halwan, Nasik). Leaves and tubers eaten. "This is a rather small, poisonous tuber. After being dug from the ground, its outer covering (rind) is removed, then cut and boiled. This being done, the pulp is immersed or dipped into a running stream for one night. It is again boiled and used as food, when mixed with spices and salt"... "has potato-like roots which are first boiled and then the root fibres are removed and thrown away and slices are made of the potato which are put into a gently running stream for the whole night and eaten the next morning just as they are." "The tuber is first plunged into water for one day and night, then it is boiled for some five or six times and then its cover is taken off and divided into two parts, subsequently salt is mixed with it." "The leaves of this plant are boiled and eaten."

Dioscorea sativa, Linn. *Kadia kand* (Generally). *Mano kando* (Walore, Surat). *Vaj kand* (Dang, Surat). *Kadawa kand* (Taloda, Khandesh). *Kedvo Kand* (Mandvi, Surat). "Is naturally bitter in taste. The essential juice must be taken away before it can be eaten. The tubers are boiled

as they are and then cut into pieces and kept for a sufficiently long time in flowing water, or they are boiled again and again—the process continuing for one night—fresh water being put in several times. Then the refuse is mixed with *konda* or some flour and eaten (the root matter deprived of the bitter juice is only used). The same remarks regarding preparation apply to the tubers of *Dioscorea pentaphylla* (chai kand) and the corms of *Sauromatum guttatum* (Diva kand)." "A bitter root; it is used for vegetable." "Toast and eat with whey." "Cut into pieces, washed with water about ten times and then seethed. They are eaten as they are or are pounded into flour and made into bread."

Dioscorea, *sp. Vaja kand* (Taloda, Khandesh). The species is doubtful owing to the absence of leaves. The tubers were planted and will, perhaps, shoot during the rains. The leaves, the stem, and the root of this creeper are whiter than those of the *Kadawa kand* (*Dioscorea sativa*). The root is highly poisonous. The poison causes great intoxication. It is sweet to the taste. The poison is got rid of by the process employed in preparing *Kadawa kand* for food. It is said that the root is so poisonous that it is resorted to in killing tigers. When tigers kill animals in their neighbourhood, the villagers insert a quantity of the flour from the pounded roots into the body of the killed animal. The poison permeates throughout the body and when the tiger returning eats it, he becomes infatuated and mad and unable to move from the place. He scarcely knows where he is, and then the villagers make short work of the animal eater."

LILIACEÆ.

Smilax, macrophylla, Roxb. *Tamboli* (Poona District). The roots and leaves are eaten. This is a common plant on the Ghats.

Asparagus racemosus, Willd. (Dict. of Econ. Prod.)

Chlorophytum tuberosum, Bak. *Safed mosali* (Shirpur, Khandesh). *Kolu* (Nasik and Ahmednagar Districts). *Sevni* (Walore, Surat). The bulbs and leaves are eaten. "It is dried up and converted into flour and made into loaves."

COMMELINACEÆ.

Commelina nudiflora, Linn. *Kena* (Poona and Ahmednagar Districts). "Leaves boiled and mixed with salt and chillies."

Commelina benghalensis, Linn. *Kena* (Nasik and Ahmednagar Districts). *Bokna* (Panch Mahals). "By threshing the creeping branches a black seed as large as *Vari* (millet) obtained and this is used for making bread after being converted into flour." "The leaves are boiled with water and mixed with salt and chillies, if available, and are used as vegetables constituting the principal part of the poor people's meal."

Commelina obliqua, Ham. *Kena* (Sangamner, Ahmednagar) *Keni* (Pimpalner, Khandesh). *Gawati kena* (Walha Parincha Road, Poona). Leaves and seeds eaten.

Cyanotis tuberosa, Schultes. *Ichaka* (Walha Parincha Road, Poona). No information received regarding parts used.

Cyanotis axillaris, Roem. & Sch. *Vichaka* (Nasik and Ahmednagar Districts). *Narido* (Wagra, Broach). *Damro* (Ahmedabad). Seeds used. "It thrives on light *mûrûm* soil and on lands lying fallow for a considerable time. It grows with grass at the commencement of the monsoon and is ripe in the month of November. The plants are pulled up and then they are threshed with a flail in order to separate the grains from the husk. It requires to be ground twice and is then made into bread. Sometimes, it is prepared as *Kanja* (boiled seeds) which is not fully ground. It is sweet to the taste when mixed with *Jowari.* Without the mixture it has no good taste. It keeps off hunger and does not deteriorate health but, on the contrary, it helps towards improving the health of those, if reduced, on account of starvation." "The seeds are ground and flour prepared. *Bhadku* is then prepared. Water is boiled with the flour and a little salt. This is called *Bhadku* when properly boiled." All these spider worts are well-known agricultural pests and towards November, fields especially on poor land, are gay every morning with the bright blue flowers. The seeds of *Cyanotis axillaris* seem to be used on a large scale, but there can be little of real nutriment in them. I have seen fields smothered with this plant, in a healthy state when

the *Bajri* has dried out on account of drought, so it must be absolutely reliable as a food product in times of dearth.

PALMEÆ.

Phœnix sylvestris, Roxb. *Kajuri.* Leaf buds and inner stems eaten. (J. C. Lisboa.)

Borassus flabellifer, Linn. *Tad; Tad-mar.* Roots eaten. (J. C. Lisboa.)

PANDANEÆ.

Pandanus fascicularis, Lamk. *Kenr.* "The tender floral leaves are eaten raw or cooked with various condiments and the pulp contained in the lower part of the drupes of the compound fruit is sucked." (J. C. Lisboa, *op cit.*)

AROIDEÆ.

Arisœma tortuosum, Schott. } *Dhúdhda; Diwa* (Poona and Ahmednagar Districts).

Arisœma Murrayi, Hook. } *Baddha* (Junnar, Poona). Corms "cooked in water and mixed with salt and chillies." These are plants of the highlands with heavy rainfall.

Sauromatum guttatum, Schott. *Divakand* (Kalwan, Nasik). Remarks regarding preparation are given under *Dioscorea sativa.* Corms used.

Typhonium trilobatum, Dalz. (J. C. Lisboa.)

Typhonium divaricatum, Dcne. (J. C. Lisboa.)

Theriophorum Dalzellii, Schott. (J. C. Lisboa.)

Amorphophallus campanulatus, Bl. *Suran* (Generally). Also commonly cultivated.

Amorphophallus bulbifer, Bl. *Lotha.* (Igatpuri, Nasik). No information received regarding parts used.

Synantherias sylvatica, Schott. *Vaja* (Bardoli, Surat).

Vagaria, (Panch Mahals.) "Cooked in water and mixed with salt and chillies."

Remusatia vivipara, Schott. *Teri* (Dang, Surat). *Asdia; Alvi.* (Panch Mahals.) No information received regarding parts used. This is a common plant in the moist hilly districts and usual grows in the forks of trees. It produces its spathes in March and April and leaves at the beginning of the monsoon. The bulbiferous shoots emerge with the leaves and persist till the following hot weather.

Musa (Kha

CYPERACEÆ.

Cyperus bulbos, Vahl. *Theg* (Ahmedabad). *Bid* (Viramgam) "It grows in a river near Viramgam. Its bulbs are dried and powdered and used with *Jowari, Bajri* or wheat flour. It is not very nutritious, therefore it is mixed with the above flours. It grows wild and its effects are that people who use it as food become night blind."

Scripus grossus, Linn. Var. *Kysoor; Kachera.* Bulbs used. (J. C. Lisboa.) It is also in general use during ordinary times, being sold in markets.

Scirpus maritimus, Linn. *Chid* (Wagra, Broach). *Dils* (Ahmedabad). The seeds are used and the plant produces them abundantly.

GRAMINEÆ.

Paspalum scrobiculatum, Linn. *Kodra* (Walha Parincha Road Poona). Grains used. This plant is also largely cultivated but it possesses poisonous properties which have to be eliminated before the grain can be safely eaten.

Panicum flavidum, Retz. *Gorin* (Wagra, Broach). Grains used.

Panicum Crus Galli, Linn. *God*; *Tan* (Kalwan Taluka, Nasik). *Ziro* (Bardoli, Surat). "The seed is threshed out and used for the preparation of bread as in the common food grains. In these days the grass is dried on fire, or the grass with the seed is turned on fire for some time and then the seed taken off and eaten as such, *i.e.*, not turned into bread."

Panicum colonum, Linn. *Tan* (Shirpur, Khandesh). *Zari* (Bardoli, Surat). *Samo* (Anklesvar, Broach). *Sama* (Matar, Kaira). "Grows in abundance on uncultivated lands. The plants bear grains in the monsoon season. When the plants are dried, the grains being ripe, people generally thresh them or gather them when they fall down of their own accord, cleanse them and grind them before using in bread or broth." This grass proved to be the most valuable resource of the starving people during the late famine in Gujarat. It prefers to grow on lands which are apt to become swamp in the rains, and it is common on the verges of sluggis streams.

Panicum prostratum, Lamk. *Pavdu* (Wagra, Broach).

Pahatu, (Ahmedabad). Grains used.

Panicum javanicum, Poir. *Barpha* (Kalwan, Nasik). *Tan* (Dindori, Nasik). *Khal kudu* (Modasa, Ahmedabad). Preparation similar to that detailed under *P. Crus Galli.*

Panicum trypheron, Schult. *Gogorat* (Newasa, Ahmednagar). "The heads when threshed give seeds like white Italian millet. It is used for bread."

Setaria glauca, Beauv. *Kolhu* (Kalwan, Nasik). *Kolvi* (Bardoli, Surat). Preparation similar to that described for *Panicum Crus Galli.* This grass is also cultivated as a field crop in some places.

Setaria intermedia, Roem. & Sch. *Pharesi* (Kaira). Grains used.

Pennisetum typhoideum, Rich. *Bajri.* Included as a famine plant in Dr. Lisboa's list.

Oryza sativa, Linn. *Niar* (Dang, Surat). *Nimar*; *Sathi* (Godhra, Panch Mahals). Wild rice. The Director of Agriculture has favoured me with the following note received from the Mamlatdar of Godhra :—

"*Nimar* grows in muddy beds of tanks only, and *Sathi* in rice fields. Private lands make no difference in the growth of the latter. *Nimar* is collected in baskets by means of beating with sticks, while *sathi* is reaped with a scythe like other kinds of paddy. Both are ready in September. Half a maund only of *Nimar* can be collected in half a day in about four hours, the muddy soil preventing the reapers staying longer; but about five maunds of *Sathi* can be gathered during a day of eight hours. An acre of land can yield twelve maunds of *Nimar* and thirty maunds of *Sathi. Nimar* is gathered by Kolis and is ordinarily used by all poor classes; and *Sathi* by all the agricultural classes, Kolis, Gandhis, Musalmans, etc. Both are used as boiled rice and are sufficiently nourishing and readily consumed by low caste people.

"*Nimar* dries up in the mud and its straw is not therefore used by cattle; on the other hand *Sathi* leaves its straw as food for cattle."

My examination of the specimens only proved that they were forms of long awned rice, and I could detect no tangible characters whereby to distinguish the two varieties. I have been informed that wild rice is largely eaten in Gujarat on fast days. So far as I have been able to ascertain wild rice

is unknown in the Deccan. Probably its introduction into swampy tracts would eventually prove to be a blessing to the people who inhabit the areas more or less liable to the recurrence of scarcity and famine. Wild rice must be common in Gujarat, the Panch Mahals and possibly other northern districts. It is surprising therefore that so little has been placed on record regarding its existence in the Bombay Presidency.

Coix lachryma-jobi, Linn. *Kaher* (Ahmedabad). Very common everywhere in swamps.

Zea mays, Linn. *Maka*. "The cobs of maize, *jowari* and *bajri* are ground and mixed with meal or flour of rice to make bread. They are a little sweet and at any rate will help to fill the empty stomach." (J. C. Lisboa.)

Andropogon sorghum, Brot. *Jowar*. (J. C. Lisboa.) For remarks see under *Zea Mays*.

Sporobolus minutiflorus, Link. *Chimanchara* (Khamgaon Tank, Poona). "Seeds mixed with *Bajri* or *Jowari* grains and made into flour."

Cynodon dactylon, Pers. *Durva, Hariali*. (J. C. Lisboa.)

Eleusine ægyptiaca, Desf. *Anchi-Manchi* (Matar, Kaira). *Anchi-Banchi* (Wagra, Broach). *Manki* (Kaira, Ahmedabad and Godhra, Panch Mahals). *Manchi* (Ahmedabad). *Manachhobi* (Ahmedabad). *Dhaphlu* (Ankleswar, Broach). "Mixed with grains of *Samo*" (*Panicum colonum*). "Cakes as well as *Bhadku* are prepared from the grains." In Gujarat this plant apparently ranked second to *Samo* alone as a food product. It is a humble plant bearing grain very profusely, and I have seen it thriving happily in November in many localities where a thin sprinkling of wretched soil scarcely hid the continuously rocky surface beneath.

Dinebra arabica, Jacq. *Kharin* (Ahmedabad). No information was received with the samples.

Eragrostis interrupta, Beauv. *Dhudi* (Wagra, Broach). No information was received with the samples.

Elurops villosus, Trin. *Del* (Wagra, Broach). *Kharin* (Jambusar). No information was received.

Triticum vulgare, Vill. *Khapli*, *Gahu*. The chaff of these is mentioned as being used by Dr. Lisboa. The first vernacular name applies to the spelt wheat, which is an irrigated crop. The second denotes indifferently any wheat.

Arundinaria Wightiana, Nees. *Chivari*. (J. C. Lisboa.) "In the scarcity of 1864 in Kanara, this (bamboo) rice formed the principal article of the food of the poor population; hence perhaps the belief entertained by some Government officials that the bamboo only flowers in seasons of general scarcity."

Bambusa arundinacea, Willd. } *Kaste* (Peint, Nasik),
Dendrocalamus strictus, Nees. } *Wans* (Dang, Surat),
Vansuta (Panch Mahals).

"The young sprouts of the bamboo tree which shoot out from under the ground. The wrappings are first removed and the stems cut into slices, boiled and then eaten. Some apply spices and salt as in preparing vegetables." The samples sent were too inadequate for certain identification, but probably both species are used.

G. I. C. P. O.—No. 132 R. & A.—7-8-1902.—375.—C. M. W.

SYSTEMATIC ENUMERATION OF THE SPECIES OF *CALAMUS* AND *DÆMONOROPS*, WITH DIAGNOSES OF THE NEW ONES.

By O. Beccari.

CALAMUS Linn.

Group I.—*Leaves* with many, more or less equidistant leaflets, and with rachis not cirriferous (not produced into a flagellum). *Primary spathes* elongate-tubular, dilated and lacerated above. *Spadix* with the partial inflorescences and spikelets provided with a pedicellar portion included in their respective spathes. *Fruiting perianth* explanate. *Spathellule* of fem. fl. short, not pedicelliform. *Albumen* ruminate. *Embryo* basilar or nearly so.

A.—*Stem* erect. *Leaf-sheaths* not flagelliferous.

1. Calamus erectus Roxb.—*C. macrocarpus* Griff.—*C. collinus* Griff. . . . . N.-E. India.
   C. erectus *v.* birmanicus Becc. . . Burma.

2(?) Calamus schizospathus Griff—*C. erectus* v. Roxb.? —Sikkim Himalaya.

B.—Scandent. *Leaf-sheaths* flagelliferous.

3. Calamus flagellum Griff.—*C. polygamus* Roxb. —N. E. India ; Burma.

Group II.—*Leaves* with many, more or less equidistant leaflets, and with rachis not cirriferous. *Primary spathes* elongate-tubular, more or less lacerate above ; *secondary* often inflated and lacerate. *Leaf-sheaths* not flagelliferous. *Spadix* with the partial inflorescences and often the spikelets with a pedicellar portion included in their respective spathes. *Fruiting perianth* explanate. *Spathellule*

of fem. fl. short, not pedicelliform. *Albumen* (where known) equable. *Embryo* basilar.

A.—*Stem* erect. *Spadix* not produced into a flagellum.

4. CALAMUS ARBORESCENS Griff.—*C. hostilis* Hort. Calc. Burma.

5. **Calamus dongnaiensis** Pierre MS. (nomen tantum).—Caespitosus, subacaulis, frondibus magnis segmentis elongato-lanceolatis, 40-60 cent. longis, 8 cent. latis, supra viridibus et nitentibus, subtus vix pallidioribus, spadicibus ♂ valde elongatis, spathis primariis tubulosis apici dilaceratis, spathis secundariis apice subinflato lanceolato-auriculaeformi inermi spicis flexuosis 10-15 cent. longis, floribus (♂) majusculis 8-10 mill. longis, 3 mill. latis.—*C. arborescenti* valde affinis foliorum segmentis utrinque viridibus differt.

Lower Cochinchina (Pierre No. 4829).

6. **Calamus dilaceratus** Becc. sp. n.—Caespitosus ? caudice erecto ? spadices erecti late paniculati non flagelliferi, ramis (inflor. partialibus) erecto-patulis 25-35 cent. longis, spicis utrinque 8-10 ; spathae primariae breves laxae apice exsuccae et dilaceratae, spiculis rectis nigris armatae ; spathae secundariae tubuloso-infundibuliformes lacero-fissae fuscescentes inermes ; spicae 4-7 cent. longae parte pedicellari gracili inclusa 1-1·5 cent. longa praeditae ; perianthium fructiferum in lobos 6 aequales partitum ; fructus parvi late ovati, abrupte apiculati, 12 mill. longi, 9 mill. lati, squamis parvis pallide stramineis apice minute fimbriato-fuscescenti ; seminibus ovatis utrinque rotundatis dorso convexis, ventre planiusculis, superficie aequabili, albumine homogeneo, embryone basilari.

Nicobar Islands (E. H. Man).

7. CALAMUS CASTANEUS Griff. . . Malayan Peninsula.

8. CALAMUS GRIFFITHIANUS Mart.—*C. castaneus* v. α Griff.

—Malayan Peninsula.

9. **Calamus Burckianus** Becc. sp. n.—Caespitosus ; frondium petiolus subteres compressiusculus elongatus inermis ; segmenta aequidistantia alterna numerosa lineari-ensiformia, majora 28-30 cent. longa, 12-13 mill. lata, utrinque viridia, supra distincte 3-nervia ; inflorescentiae partiales spadicis ♀ circiter 50 cent. longae, apici caudiculo inermi terminatae, spathis secundariis tubuloso-infundibuliformibus inermibus, spicis basi parte pedicelliformi inclusa praeditis, vermicularibus, flexuosis, 12-15 cent. longis ; fructibus globosis abrupte apiculatis 9-10 mill. diam., seminibus laevibus late ovatis compressiusculis, dorso convexis, ventre umbilicatis, albumine aequbili, embryone subbasilari.

Java (Teijsmann in Herb. St. Pet.)

B.—Scandent. *Spadix* produced into a flagellum. (*Leaf-sheaths* sometimes flagelliferous ?).

10. CALAMUS LONGISETUS Griff.—*C. tigrinus* Kurz.
—Burma; Andaman Islands.

11. CALAMUS THWAITESII Becc.—*C. longisetus* (not of Gr.) Thw. . . . . Ceylon.

12. **Calamus Zollingerii** Becc. sp. n. . . . Celebes.

13. CALAMUS RUDENTUM Lour. (Pierre Nos. 4845, 4846).
—Cochinchina.

GROUP III.—*Leaves* with many more or less equidistant leaflets; rachis not cirriferous. *Leaf-sheaths* flagelliferous. *Spathes* (primary and secondary) elongate-tubular strictly sheathing. *Spadix* with the partial inflorescences and often the spikelets with a pedicellar portion included in their respective spathes. *Fruiting perianth* explanate. *Spathellule* of the fem. fl. short, not pedicelliform. *Albumen* equable. *Embryo* basilar.

A.—Asiatic.

14. CALAMUS LEPTOSPADIX Griff. . . . . N.-E. India.

15. **Calamus Henryanus** Becc. sp. n.—Gracilis, scandens; frondium segmenta inaequidistantia, anguste ensiformia basi attenuata apici acuminatissima, utrinque in sicco pallide viridia, subtiliter longitudinaliter nervoso-striata, nervis 5 tenuibus percursa utrinque minute spinulosis, 35-40 cent. longa, 14-17 mill. lata; spadix foemineus strictus, spica elongata terminatus; spicis erectis sparsis (nec disticis) parte pedicellari inclusa praeditis, basilaribus elongatis; floribus numerosis erectis; spathae secundariae inermes; spathellae spathaceo-auriculaeformes; involucrophorum ad basin spathellae insertum; flos sterilis pedicello elongato persistenti suffultus, fructus parvi obovati abrupte rostrati, 12 mill. longi; perianthium fructiferum in lobos 6 subaequales usque ad basin partitum.

Yunnan; Szemao Mounts. (A. Henry, No. 12,239 in Herb. Calc.).

16. CALAMUS RIVALIS Thw. . . . . Ceylon.

B.—African.

17. CALAMUS DEERRATUS Mann & Wendl.
—Western Tropical Africa.

18. **Calamus Barterii** Becc. sp. n. (Barter No. 110 in Hort. Kew.) Western Tropical Africa.

19. **Calamus Heudelotii** Becc. sp. n.—Gracilis, caudice 2-3 met. longo; vaginae flagelliferae 1 cent. diam., spinis rectis brevibus semiconicis sparse armatae, in ore ligula oppositifolia triangulari 2

cent. longa spinulis brevibus seriatis in medio longitudinaliter armata, marginibus integris laevibus, praeditae; frondes 60-70 cent. longae, petiolo breviusculo subtus in medio spinis paucis solitariis rectis subreversis armato, rachi reduncо-aculeata, segmentis non numerosis irregulariter fasciculatis, apicalibus basi disjunctis, basilaribus, majoribus, 25-28 cent. longis, 12-16 mill. latis, lanceolato-linearibus, subulato-acuminatis, in sicco viridibus, subtus pallidioribus, tenuiter longitudinaliter nervosis et costa media sparse spinulosa, in facie superiore costulis tenuibus 3 spinulosis et nervulis minoribus percursis, marginibus minute spinuloso-serratis; spadicis ♀ inflorescentiae partiales parte pedicellari praeditae, spicis non pedicellatis, brevibus 2-3 cent. longis, recurvis; spathae secundariae laeves; fructus ovati, basi rotundati, apice conico-rostrati, 13-15 mill. longi, 9 mill. lati, semine elongato-ovoideo, superficie fere aequabili, non ruminato, embryone basilari.

Senegambia (Heudelot No. 372 in Herb. Webb. et Herb. Kew.) Gambia (Ingram in Herb. Kew).

20. **Calamus Leprieurii** Becc. sp. n.—Scandens? Frondium petiolus furfurascens subtus et ad margines, et rachis tantum in medio, spinis validiusculis sparsis solitariis rectis horizontalibus armatus; segmenta aequidistantia opposita, lineari-lanceolata acuminata, 15-17 cent. longa, 15 mill. lata, subtus pallidula, ad basin superne lateraliter spinula substipulaeformi praedita, utrinque in nervo primario solitario tantum spinulosa; spicae 8-9 cent. longae, floribus erecto-patulis disticis utrinque 9-10; spathellis obconico-campanulatis apiculatis nudis, involucrophoro in fundo spathellae inserto; perianthium fructiferum usque ad basin in 6 lobos subaequales partitum; fructus squamis basi stramineis, late brunneo-marginatis et apice scarioso fimbriato denticulato.

Senegal (Leprieur in Herb. Leyd.)

21. **Calamus Perrotetii** Becc. sp. n.—*Calamo Leprieurii* similis differt spicarum spathellis amplioribus flores amplectentibus.

Senegal; on the River Casamanza (Perrotet, 10th April 1829, No. 761 in Herb. Delessert.).

22. CALAMUS SCHWEINFURTHII Becc.—*C. secundiflorus* (not of P. de B.) Schw. . . . . Central Africa.

GROUP IV.—*Leaves* not produced into a cirrus, with very few, usually radiating or digitate, leaflets. *Primary* and *secondary spathes* very elongate-tubular and strictly sheathing. *Leaf-sheaths* flagelliferous. *Spadix* ♂ and ♀ simply decompound; partial inflorescences and spikelets not pedicellate and inserted at the

mouth of their respective spathe. *Fruiting perianth* explanate. *Spathellule* of the ♀ flower never pedicelliform. *Albumen* equable. *Embryo* basilar.

23 CALAMUS PACHYSTEMONUS Thw. . . . Ceylon.
24. CALAMUS DIGITATUS Becc.—*C. pachystemonus* (partly) Thw. —Ceylon.
25. CALAMUS RADIATUS Thw. . . . . Ceylon.

GROUP V.—*Leaves* not produced into a cirrus. *Leaf-sheaths* flagelliferous. *Primary* and *secondary spathes* very elongate-tubular, strictly sheathing and entire at the mouth. *Spikelets* inserted at the mouth of their respective spathe. *Seed* not ruminate, dorsally alveolate. *Embryo* basilar.

A.—Leaves *with few leaflets usually broad, lanceolate or elliptic, more rarely elongate-lanceolate, the two terminals confluent or connate in the lower portion.* Secondary spathes, spathels *and* spathellules *not or scarcely scabrous.*

⊙ *Spathellule* of the ♀ flower not pedicelliform. *Fruiting perianth* hardly callous at the base, not or slightly pedicelliform.

26. CALAMUS JAVENSIS Bl. (type) . . Java; Sumatra.
C. JAVENSIS *v.* PENINSULARIS Becc. . Malayan Peninsula.
Subvar. PURPURASCENS Becc. . . Penang.
Subvar. PINANGIANUS Becc. . . . Penang.
C. JAVENSIS *v.* POLYPHYLLUS Becc. . Malayan Peninsula.
C. JAVENSIS *v.* INTERMEDIUS Becc. . Malayan Peninsula.
C. JAVENSIS *v.* TENUISSIMUS Becc. . Malayan Peninsula.
C. JAVENSIS *v.* TETRASTICHUS Bl.—C. *tetrastichus* Bl.—*C. borneensis* Miq.—*C. amplectens* Bl. . . Borneo.

27. CALAMUS FILIFORMIS Becc. . . . Borneo.

28. **Calamus corrugatus** Becc. sp. n.—Gracilis, caudice valde elongato tenuissimo; frondes breves, 30-35 cent. longae, vagina inermis sed transverse crebreque costulis prominulis notata, petiolo brevi, segmentis paucis remote oppositis lanceolato-ellipticis costulis 3 utrinque nudis percursis, majoribus 12-13 cent. longis, 2 5 cent. latis, apicalibus usque ad medium connatis.—*C. javensi* proximus.

Borneo; Sarawak (Beccari P. B. No. 1910).

29. CALAMUS SCHISTOACANTHUS Bl. . . Sumatra.
30. CALAMUS DIOICUS Lour. (Pierre No. 4834). Cochinchina.
31. CALAMUS PAPUANUS Becc. . . . New Guinea.
32. CALAMUS FLABELLATUS Becc. . . Borneo.

33. **Calamus spinilifolius** Becc. sp. n.—Gracilis; frondium segmenta inaequidistantia, 2 apicalia basi breviter connata lateralia saepe geminata, omnia convexa, oblonga vel oblanceolata, 10-12 cent. longa, 2·5-3·5 cent. lata, basi attenuata, apici abrupte acuminata, glabra, utrinque viridia subconcolora, costulis 5 subtus nudis, supra spinulis acicularibus remotis rigidis erectis, 4-8 mill. longis, conspicue armata.

Philippines (Vidal No. 3954).

34. CALAMUS FILIPENDULUS Becc. . . Malayan Peninsula.

35. **Calamus gonospermus** Becc. sp. n.—Scandens; caudices digiti crassitiae, vaginis flagelliferis, spinis rectis breviusculis armatis; frondes breves (circ. 50 cent. long.) petiolo breviusculo redunco-aculeato, segmentis perpaucis (6) duobus apicalibus alte connatis, oblongo-lanceolatis vel oblanceolatis, concaviusculis 20-22 cent. longis, 45-55 latis; basi attenuatis, apici abrupte in caudiculum linearem ciliato-spinulosum 2 cent. longum attenuatis, utrinque viridibus, costulis 5 utrinque nudis percursis, marginibus quoque nec ciliatis nec spinulosis; spadicis ♀ spathae primariae arcte tubulosae, aculeatae, ore truncato integro; spicae paucae abbreviatae scorpioideae, floribus unilateralibus congestis; fructibus majusculis late ovato-ventricosis, basi attenuatis apice conico acuto, squamis convexis latis, basi stramineis margine et apice atro-castaneo apicalibus nigrescentibus; seminibus irregulariter globosis et acute angulosis; albumine aequabili.

Borneo; Sarawak (Beccari P. B. No. 23).

36. CALAMUS MUELLERII H. Wendl. . . . Australia.

37. CALAMUS CARYOTOIDES H. Wendl. . . Australia.

⊙ ⊙ *Spathellule* shortly pedicelliform. Fruiting *calyx* pedicelliform.

38. CALAMUS CUTHBERTSONII Becc. . . New Guinea.

B.—Leaves *usually with few inequidistant elongate leaflets, the two terminals shortly connate at the base.* Fruiting calyx *spreading, not callous at the base or pedicelliform.* Secondary spathes, spathels *and* spathellules *conspicuously scabrid.*

39. **Calamus ruvidus** Becc. sp. n.—Scandens; vaginae spinis validis brevibus (majoribus 4·5 mill. long.) ad basin inflatis subtus concavis armatae adjectis costulis transversalibus prope apicem crebrioribus. Frondium (circ. 50 cent. long.) petiolus breviusculus subtus aculeis reduncis armatus; segmenta perpauca (3 in utroque latere) irregulariter alterna, 2 apicalia breviter basi connata, lanceolato-elliptica abrupte apiculata 24-25 cent. longa, 4-5 cent. lata,

3-4-costulata, lateralia angustioria et longiora, anguste oblanceolata, supra acute 3-costata, utrinque viridia, nitida et nuda; spadix breviusculus (60 cent.) apice breviter caudatus; spathae primariae tubulosae, apici exsuccae et lacerae in dorso aculeatae, inflorescentiae partiales patentes, majora 20 cent. longa, spicis utrinque numerosis alternatim distice horizontalibus vermicularibus; spathis secundariis elongatis tubuloso-infundibuliformibus tuberculato-scabridis; spathellis brevissimis scaberrimis; fructibus parvis, sphaericis (immaturis 7 mill. diam.)

Borneo; Sarawak (Lobb in Herb. Kew).

40. **Calamus scabridulus** Becc. sp. n.—Frondium rachis supra acutissima bifacialis, subtus aculeis validis reduncis solitariis apice nigris armata; segmenta numerosa subaequidistantia remotiuscula, anguste lanceolato-ensiformia acuminata, basi attenuata utrinque viridia et subnitentia, supra in costulis 3 acutis spinosula, subtus secus nervos primarios 3 tenues parce spinulosa, marginibus fere nudis, majora 40-45 cent. longa, 2-2·5 cent. lata, 2 apicalia paulo latiora sed breviora et basi breviter connata; spadicis infl. partiales valde elongatae; spathis secundariis scabrido-aculeatis; spicis reflexis, spathellis brevissimis tuberculoso-hispidulis.—*C. ruvido* affinis.

Billiton (Riedel) and probably also in Borneo (Motley in Herb. Kew).

41. CALAMUS MURICATUS Becc. . . . . Borneo.
42. CALAMUS ZONATUS Becc. . . . . Borneo.

C.—*As in B., but* leaflets *numerous, equidistant;* spathes, spathels *and* spathellules *conspicuously scabrid.*

43. CALAMUS RADULOSUS Becc. . . Malayan Peninsula.
44. CALAMUS RUGOSUS Becc. . . Malayan Peninsula.

D.—Leaflets *many, narrow, often fascicled;* spathes, spathels *and* spathellules *smooth or more or less aculeate but never scabrid.* Fruiting calyx *explanate.*

45. CALAMUS VIMINALIS Willd. (type)—*C. buroënsis* (partly) Mart.—*C. litoralis* Bl.—*Palmajuncus viminalis* Rumph. —Java.

C. VIMINALIS *v.* FASCICULATUS Becc.—*C. fasciculatus* Roxb.—*C. extensus* (not of Roxb.) Mart.—*C. pseudo-Rotang* Mart.

—Bengal; Burma; Tenasserim; Pinang; Andaman Islands.

46. **Calamus siamensis** Becc. sp. n.—Caudex scandens digiti crassitiae, vaginis spinis longiusculis solitariis vel confluentibus

et oblique seriatis armatis ; frondium petiolus brevissmus spinis rectis longis horizontalibus armatus, rachi in dorso spinis rectis longis solitariis deflexis, aculeis reduncis intermixtis, armata; segmenta numerosa approximata aequidistantia anguste lanceolata, supra in costa media, subtus in nervis 3 spinulosa, marginibus patule crebreque serrulato-spinulosis; spadicis ♀ spathae primariae elongato-tubulosae, aculeatae, in ore oblique truncatae; inflorescentiae partiales 12-15 cent. longae, spicis disticis utrinque 5-6, 8-9 cent. longis; floribus 4-seriatis.—*C. viminali* valde affinis differt segmentis aequidistantibus et floribus ante anthesin 4-seriatis.

Siam (Schomburgh in Herb. Kew).

47. CALAMUS CONCINNUS Mart. . . . Mergui.
48. CALAMUS FLORIBUNDUS Griff.—*C. mishmeensis* Griff.—*C. multiflorus* Mart. . . . . N.-E. India.
49. CALAMUS MOLLIS Blanco—*C. Hankeanus* Mart.—*C. usitatus* (not of Blanco) Vidal . . . . Philippines.
50. CALAMUS BLANCOI Kunth—*C. gracilis* (not of Roxb.) Blanco —*C. brevifrons* Mart.—*C. parvifolius* (not of Roxb.) Vidal —*C. usitatus* (not of Blanco) Mart. . Philippines.
51. CALAMUS PSEUDO-TENUIS Becc.—*C. tenuis* (not of Roxb.) Thw. . . . . S. India; Ceylon.
52. CALAMUS RADICALIS H. Wendl. . . Australia.
53. CALAMUS ZEBRINUS Becc. . . . New Guinea.
54. CALAMUS BARBATUS Bl. . . . New Guinea.
55. CALAMUS INTERRUPTUS Becc. . . New Guinea.
56. CALAMUS DOCILIS Becc.—*C. interruptus* v. *docilis* Becc. —New Guinea.
57. CALAMUS SERRULATUS Becc. . . . New Guinea.

E.—Leaflets *as in D., but more numerous, usually narrow (lanceolate in* C. salicifolius). Fruiting perianth *slightly callous at the base and subpedicelliform.*

58. **Calamus nematospadix** Becc. sp. n.—Scandens, caudice digiti crassitiae, vaginis dense spinis laminaribus lanceolatis parvis armatis; frondium (80-90 cent. long.) petiolus elongatus marginibus aculeatis segmenta 15-30 in utroque latere aequidistantia, lineari-ensiformia, 20-30 cent. longa, 1-2 cent. lata, basi attenuata, apici acuminata, supra substriato-multinervia, costulis majoribus 3 percursa, quarum costula media nuda et costulis lateralibus spinulosis, subtus costa media superficiali spinulosa, et nervis lateralibus nudis; marginibus prope apicem tantum inconspicue spinulosis; spadices longissimi (ultra 3-metrales) gracillimi filiformes, apici

flagello tenuissimo aculeato terminati; spathae primariae angustissimae, tubulosae, parcissime aculeatae; inflorescentiae partiales paucae remotissimae et valde elongatae, floribus ♂ minutissimis; fructus parvi, inter minores, sphaeroidei pisi magnitudine, semine globoso 4·5 mill. diam., albumine aequabili.

Borneo; Sarawak (Beccari P. B. Nos. 1000, 2760, 2927).

59. CALAMUS PYGMAEUS Becc. . . . . Borneo.

60. **Calamus borneensis** Becc. sp. n.—Mediocris, scandens; frondium rachis subtus prope apicem subregulariter aculeis reversis solitariis armata; segmenta numerosa aequidistantia remotiuscula, anguste lineari-ensiformia, basi breviter attenuata, apici sensim attenuato-acuminata, supra costulis 3 acutis setosis percursa, subtus pallidiora, nervis tenuibus, costa media superficiali interdum prope apicem parce setosa, marginibus minute et inconspicue spinuloso-ciliolatis, majora 30 cent. longa, 13 mill. lata, 2 apicalia minora e basi libera; spadices ♀ longissimi filiformes; spathae primariae et secundariae valde elongatae angustissimae, arcte tubulosae; inflorescentiae partiales valde elongatae, spicis numerosis distice paullo supra spatharum faucem horizontaliter callo insertis, filiformibus 10·15 cent. longis utrinque floribus 10-19 distice onustis. Fructus (immaturi) parvi subgloboso-ovati, rostrati, perianthio basi calloso subpedicelliformi suffulti.

Borneo; Sarawak? (Lobb. in Herb. Calc.).

61. CALAMUS REINWARDTII Mart. . . . . Java.

C. REINWARDTII *v.* AMPLUS Mart. . . . . Java.

C. REINWARDTII subsp. HETEROIDEUS Becc.—*C. heteroideus* Bl. with the vars. *β procerus*, *γ refractus*, *δ conjugatus*, *ε spissus* . . . . . Java.

C. REINWARDTII *v.* PALLENS Becc.—*C. pallens* Bl. . Java.

62. CALAMUS OPACUS Bl. . . . . Sumatra.

63. CALAMUS DENSIFLORUS Becc. . . Malayan Peninsula.

64. **Calamus Ridleyanus** Becc. sp. n.—Scandens; frondium rachis subtus aculeis reduncis validis sparsis apice nigris armata; segmenta numerosa aequidistantia, lineari-lanceolata, basi attenuata, apici acuminata, majora 45 cent. longa, 2·5 cent. lata, superiora sensim minora, apicalia parva, utrinque viridia et subnitentia, supra costulis prominentibus 3 nudis, subtus nervis tenuibus et apice versus setulosis percursa, marginibus nudis; spadix ♀ valde elongatus, 3-metralis et ultra, flagello aculeato elongato terminatus; spathae primariae arcte tubulosae in ore truncatae, dense spinulis parvis armatae; inflorescentiae partiales paucae valde elongatae (usque 75 cent.

longae) spicis numerosis disticis crassiusculis 7-8 cent. longis curvulis onustae, spathis secundariis tubulosis apici parum ampliatis dense aculeolatis, spathellis brevissimis concavo-cochleariformibus integris truncatis vix acutis, deciduc furfuraceis.—*C. densiflora* valde affinis, differt praecipue inflorescentiis valde elongatis et spathis primariis et secundariis dense spinulosis.

Singapore (Ridley).

65. CALAMUS LURIDUS Becc. . . . Malayan Peninsula.
66. CALAMUS DELICATULUS Thw. . . . . Ceylon.
67. CALAMUS HELFERIANUS Kurz. . Tenasserim?; Andamans?
68. CALAMUS NICOBARICUS Becc. . . . . Nicobars.

69. **Calamus salicifolius** Becc. sp. n.—Caespitosus, 1-3 metr. altus, caudice gracili 6-7 mill. diam., vaginis flagelliferis nudis vel sparse spinis parvis rectis armatis; frondes paripinnatae breves, 20-30 cent. longae, segmentis paucis remote fasciculatis, lanceolatis, parvis, rigidis, utrinque pallide viridibus, 5-9 cent. longis, 8-15 mill. latis, costa media in pagina superiore spinulis acicularibus 1-3 erectis praedita, in pagina inferiora minute puberulo-papillosis, marginibus remote et patule spinuloso-ciliatis, segmentis apicalibus minoribus e basi omnino liberis; spadices ♀ erecti, parvi, 25-35 cent. longi, spicis parvis brevibus (1-2 cent. longis) curvulis, fructibus parvis globosis abrupte rostratis, perianthio basi calloso breviter pedicelliformi suffultis, semine irregulariter globoso, superficie inaequali, albumine aequabili.

Lower Cochinchina (Pierre No. 4853).

F.—Leaflets *narrow or rather large.* Fruiting perianth *distinctly pedicelliform.*

70. CALAMUS TENUIS Roxb.—*C. Royleanus* Griff.—*C. amarus* Lour.—*C. Heliotropium* Ham. . . N. India.
71. CALAMUS HORRENS Bl. . . . . Java.
72. CALAMUS TETRADACTYLUS Hance . . China.
73. CALAMUS DIFFUSUS Becc. . . . Singapore.
74. CALAMUS WALKERII Hance . . . China.
75. CALAMUS BACULARIS Becc. . . . Borneo.
76. CALAMUS ROTANG Linn.—*C. Roxburghii* Griff.—*C. monoicus* Roxb.—*C. Scipionum* (partly) Lamk S. India; Ceylon.
77. CALAMUS BRANDISII Becc. . . . S. India.
78. CALAMUS FEANUS Becc. . . . Tenasserim.
79. CALAMUS ACANTHOSPATHUS Griff.—*C. montanus* T. And. —N. E. India.

GROUP VI.—*Rachis* of leaves not produced into a cirrus. *Leaf-sheaths* flagelliferous or not. *Primary spathes* very long, at first

tubular closed, at length longitudinally split open, loriform, laminar or foliaceous. *Seed* not superficially alveolate; albumen equable.

80. CALAMUS GURUBA Ham.—*C. Mastersianus* Griff.—*Daemonorops Guruba* v. *Hamiltonianus*, and v. β *Mastersianus* Mart. . . . . N. E. India.

81. CALAMUS PLATYSPATHUS Mart.—*Daemonorops platyspathus* Mart. . . . . Tenasserim.

82. CALAMUS PASPALANTHUS Becc. Malayan Peninsula; Borneo.

83. CALAMUS RAMOSISSIMUS Griff.—*Daemonorops ramosissimus* Mart. . . . . Malayan Peninsula.

84. CALAMUS PERAKENSIS Becc. . . Malayan Peninsula.

85. CALAMUS HYPOLEUCUS Becc.—*Daemonorops hypoleucus* Kurz. . . . . Burma.

86. CALAMUS MYRIANTHUS Becc. . . . . Mergui.

GROUP VII.—*Rachis* of leaves not produced into a cirrus. *Leaf-sheaths* flagelliferous. *Primary* spathes at first tubular-elongate, at length longitudinally more or less split and partly laminar. *Fruiting perianth* more or less pedicelliform. *Spathellule* distinctly pedicellate. *Seed* dorsally alveolate; albumen subruminate.

87. CALAMUS TRAVANCORICUS Bedd.—*Tsjeru-Tsjurel* Rheede —S. India.

88. CALAMUS RHEEDEI Griff.—*Daemonorops Rheedii* Mart.—*Katu-Tsjurel* Rheede . . . . S. India.

GROUP VIII.—*Rachis* of leaves not produced into a cirrus. *Leaf-sheaths* flagelliferous. *Primary spathes* tubular, strictly sheathing, not split or lacerate. *Spathellule* of fem. fl. pedicelliform, *i.e.*, exserted beyond the spathels and as it were supported on a pedicel. *Fruiting perianth* pedicelliform. *Seed* furrowed on its surface; albumen ruminate; *embryo* basilar.

89. CALAMUS HUEGELIANUS Mart.—*C. Wightii* Griff.—*C. melanolepis* H. Wendl.—*C. dioicus* (not of Roxb.) Mart. —S. India.

90. CALAMUS GAMBLEI Becc. . . . . S. India.
C. GAMBLEI *v.* SPHAEROCARPUS Becc. . . S. India.

GROUP IX.—*Rachis* of leaves not produced into a cirrus. *Leaf-sheaths* flagelliferous. *Primary spathes* strictly sheathing. *Spathellule* not pedicelliform. *Fruiting perianth* pedicelliform. *Albumen* deeply ruminate.

A.—Embryo lateral.

91. CALAMUS GRACILIS Roxb. . . . N. E. India.
92. CALAMUS MELANACANTHUS Mart. . . Tenasserim.

B.—Embryo basilar (where known).

93. CALAMUS DIEPENHORSTII Miq. Malayan Peninsula; Sumatra.
94. CALAMUS MARGINATUS Mart.—*Dæmonorops*? *marginatus* Bl. . . . . Borneo.
95. CALAMUS SINGAPORENSIS Becc. . . Singapore.

GROUP X.—*Leaves* not produced into a cirrus. *Leaf-sheaths* flagelliferous. *Primary spathes* strictly sheathing. *Spathellule* distinctly pedicelliform. *Fruiting perianth* pedicelliform. *Seed* ruminate (with many plaits radiating from the centre to one face); *embryo* lateral.

96. CALAMUS CILIARIS Bl. . . . Java; Sumatra.
97. CALAMUS EXILIS Griff. . . . Malayan Peninsula.

98. **Calamus pilosellus** Becc. sp. n.—Gracilis, vaginis 1 cent. diam. vix spinosis sub lente minutissime tuberculatis; frondium (60 cent. long.) petiolus brevis; rachis furfuracea et pilis basi bulbosis induta; segmenta numerosa (in quovis latere circiter 35) approximata et regulariter aequidistantia, anguste lanceolata utrinque aequaliter et sensim attenuata, majora 10 cent. longa, 10-11 mill. lata, in facie superiore subnitentia, costa media nervis primariis 2 setis longis obsitis percursa, nervis secundariis quoque pilosis in facie inferiore scabrida spinulis minutissimis causa, secus nervos (circiter 50) tenuissimos, seriatis; spadix ♂ elongatus apici flagelliferus, spathis tubulosis parce aculeatis laevibus nec scabridis.

Borneo (Lobb in Herb. Kew).

99. **Calamus sarawakensis** Becc. sp. n.—Gracilis, vaginis flagelliferis 7-10 mill. diam, sub lente minutissime tuberculato-scabridulis, spinis paucis brevibus horizontalibus vix armatis; frondium (60-65 cent. long.,) petiolus longiusculus subtus et in margine spinulosus; segmenta utrinque 16-18 inaequidistantia, lineari-ensiformia, majora 20-22 cent. longa, 15-16 mill. lata, basi longiuscule attenuata, apici acuminata, nervis primariis in facie superiore 5-7 spinuloso-ciliatis percursa, nervis minoribus interdum quoque indistincte spinulosis intermixtis, subtus nervis tenuibus numerosissimis et minute ciliolatis.—*C. ciliari* proximus.

Borneo; Sarawak (Beccari P. B. No. 1920).

100. **Calamus hispidulus** Becc. sp. n.—Gracilis, vaginis circ. 18 mill. diam., novellis dense setoso-pilosis, demum tuberculato-scabridis; frondium petiolus brevis scabridus; segmenta non numerosa (in utroque latere 11-13) aequidistantia angustissime lanceolata, basi attenuata, apici acuminata, majora 10-20 cent. longa, 10-15 mill. lata, supra in costa media et secus nervos 6-8 (subtus 26-28) minutissime spinuloso-hispidula; spadicis spathae minutae papilloso-scabridulae; fructus elongato-elliptici, utrinque acuti.—*C. exili* affinis, differt segmentis paucioribus et vaginis novellis pilis fulvescentibus dense indutis.

Borneo; Sarawak (Beccari P. B. No. 2821).

GROUP XI.—*Leaf-sheaths* flagelliferous. *Leaflets* broad, many-nerved, two terminals completely free, often with a very short or rudimentary cirrus interposed. *Spathes* tubular, strictly sheathing. *Spathellule* not pedicelliform. *Fruiting perianth* subpedicelliform. *Seed* (where known) with albumen superficially ruminate and basilar *embryo*.

101. CALAMUS RHOMBOIDEUS Bl. . . . . Java.

102. CALAMUS SPECTABILIS Bl. . . . . Sumatra.

103. **Calamus Bousigonii** Pierre MS. (nomen).—Scandens, gracilis, caudicibus vaginatis 10-12 mill. diam., vaginis spinis parvis rectis sparsis basi tuberculoso-dilatatis armatis; frondes breviusculae (75-85 cent. longae) paripinnatae, segmentis paucis irregulariter alternis 10-20 cent. longis, 3-8 cent. latis, apicalibus omnino liberis ovatis vel obovatis vel subrhomboideo-ovatis, basi attenuatis, viridibus, subtus vix pallidioribus, glabris, nerviis 5-7 e basi radiatim divergentibus setis aut spinulis omnino destitutis percursis, marginibus prope apicem setoso-ciliatis; spadices breves erecti, spathis primariis arcte tubulosis et dense spinosis, inflorescentiis partialibus brevibus; fructibus subgloboso-ovoideis, abrupte apiculatis, 18 mill. longis, 14 mill. latis, perianthio basi calloso et breviter pedicelliformi suffultis; semine ovoideo-oblongo dorso alveolato, albumine aequabili.—*C. rhomboideo* affinis.

Lower Cochinchina (Pierre No. 4836).

104. CALAMUS BLUMEI Becc.—*C. rhomboideus* v. *rigida* Bl. —Borneo.

105. CALAMUS TOMENTOSUS Becc. . . Malayan Peninsula.

C. TOMENTOSUS *v.* KORTHALSIAEFOLIUS Becc. —Malayan Peninsula.

GROUP XII.—*Leaves* produced into a cirrus. *Leaf-sheaths* not flagelliferous. *Leaflets* often more or less narrowly lanceolate,

Spathellule of fem. fl. distinctly pedicelliform. *Seed* (where known) not ruminate.

106. CALAMUS HETERACANTHUS Zipp. . . New Guinea.
107. CALAMUS SYMPHYSIPUS Mart. . . . Celebes.

108. **Calamus Cumingianus** Becc. sp. n.—Frondium rachis subtus in medio et ad margines aculeis reduncis solitariis validiusculis apice nigris armata et supra ad latera spinulosa; segmenta inaequidistantia irregulariter 2-4 aggregata, spathulata, basi attenuata, 20-24 cent. longa, 5-5·5 cent. lata, apici abruptissime apiculata, utrinque glabra, viridia subtus pallidioria, plicato-multinervia, costa media supra remote spinulosa, subtus nuda, nervis secundariis utrinque nudis, marginibus crebre serrulato-spinulosis; spadicis ♀ spathae primariae tubulosae, laxiuscule vaginantes et saepe longitudinaliter fissae, aculeolatae; inflorescentiae partiales breves arcuatae, spicis laxifloris, floribus involucrophoro elongato suffultis et distincte pedicellatis.—*C. symphysipo* et *C. heteracantho* ut videtur affinis.

Philippines (Cuming No. 762 in Herb. Kew).

109. **Calamus kandariensis** Becc. sp. n.—Scandens, gracilis, vaginis 8-10 mill. diametro indumento griseo-furfuraceo detergibili indutis subinermibus vel spinis brevissimis parce armatis; frondes cirriferae, petiolo brevi, segmentis paucis patentibus in utroque latere remote approximatis, anguste lanceolato-ellipticis, basi attenuatis, apici acuminatis utrinque subconcoloribus, nervis omnibus tenuibus una cum marginibus et apice omnino setis vel spinulis destitutis, majoribus 20-22 cent. longis, 2-2·5 cent. latis; spadices breviusculi, non flagelliferi, spathis primariis laxe tubulosis, vix dorso aculeolatis, indumento griseo-furfuraceo detergibili obtectis.

Var. **glabratus**: vaginis glabris et petiolis spinis longioribus armatis.

Celebes; Lepo-Lepo in Kandari (Beccari 1874).

110. CALAMUS ADSPERSUS Bl. . . . . Java.
111. CALAMUS PLICATUS Bl. . . . . Celebes.

GROUP XIII.—*Leaves* produced into a long-clawed cirrus. *Leaf-sheaths* not flagelliferous. *Primary spathes* elongate-tubular. *Spathellule* of fem. fl. not pedicelliform. *Fruiting perianth* pedicelliform. *Seed* (where known) with albumen ruminate and basilar embryo.

112. CALAMUS ZEYLANICUS Becc.—*C. rudentum* (not of Lour.) Thw. . . . . Ceylon.

113. CALAMUS LATIFOLIUS Roxb.—*C. inermis* T. And. — N.-E. India.

C. LATIFOLIUS subsp. MACRACANTHUS Becc. — *C. macracanthus* T. And. . . . . N. E. India.

114. CALAMUS DORIAEI Becc. . . . . Burma.

115. CALAMUS MANAAN Miq. . . . . Sumatra.

116. CALAMUS SIMPLEX Becc. . . Malayan Peninsula.

117. CALAMUS CAESIUS Bl.—*C. glaucescens* Bl. —Borneo; Malayan Peninsula.

118. CALAMUS OPTIMUS Becc. . . . Borneo.

119. CALAMUS AXILLARIS Becc. . . Malayan Peninsula.

120. CALAMUS PALLIDULUS Becc. . . Malayan Peninsula.

GROUP XIV.—*Leaves* produced into a long-clawed cirrus. *Leaf-sheaths* not flagelliferous. *Primary spathes* elongate-tubular. *Fruiting perianth* (where known) not pedicelliform. *Spathellule* of fem. fl. not pedicelliform. *Seed* dorsally alveolate, not ruminate; *embryo* basilar.

A.—Scandent.

121. CALAMUS OVOIDEUS Thw. . . . . Ceylon.

122. CALAMUS ANDAMANICUS Kurz . Andaman Islands.

C. ANDAMANICUS *v.* NICOBARICUS Becc. . Nicobar Islands.

123. CALAMUS PALUSTRIS Griff.—*C. latifolius* (not of Roxb.) Kurz. . . . Mergui; Andamans; Tenasserim.

C. PALUSTRIS *v.* COCHINCHINENSIS Becc. (Pierre No. 4847). —Cochinchina.

124. **Calamus formosanus** Becc. sp. n.—Caudicis vagina 3-3·5 cent. diam. apici valde gibbosa et nuda, caeterum spinis laminaribus subulatis 1-2 cent. longis armata; frondium petiolus brevissimus; rachis supra in parte basilari spinosa, subtus apicem versus aculeis reduncis simplicibus armata; segmenta valde irregulariter distributa, solitaria vel saepius in quovis latere geminatim vel ternatim remote aggregata, lanceolato-oblonga, costulis 5 nudis percursa.—*C. palustris* v. *cochinchinensi* valde affinis, differt praecipue frondium petiolo subnullo.

Formosa (Oldham in Herb. Kew).

125. **Calamus Moseleyanus** Becc. sp. n.—Frondium rachis prope basin trigona, in parte apicali subtetragona, subtus aculeis reduncis validis solitariis remote armata; segmenta non numerosa,

remota, inaequidistantia nec aggregata, elongato-lanceolata, 25-32 cent. longa, 3-4·5 cent. lata, utrinque aequaliter attenuata, acuminata, apice setoso-penicillata, supra opaca, subtus subconcolora, costulis 5 percursa, quarum medialis supra valdiuscula nuda, lateralibus minoribus et spinuloso-ciliatis, subtus nervis omnibus inconspicuis et nudis; spadicis spathae primariae elongato-tubulosae aculeolatae; spathae secundariae tubuloso-infundibuliformes inermes; spicae erecto-patulae, curvulae 4·5-6 cent. longae, floribus 10-12 distice utrinque praeditae: fructus parvi globosi 8-9 mill. diam. apiculati, perianthio pedicelliformi suffulti, squamis laxe imbricatis, semine subgloboso, superficie inaequali, albumine aequabili.

Philippines; Malanipa, (Moseley in Herb. Kew).

126. **Calamus Vidalianus** Becc. sp. n.—Frondium rachis in parte basilari subtus convexa et nuda, longitudinaliter ad latera sulcata, aculeis vix reduncis dense armata, in facie superiore convexiuscula dense spinosa; segmenta aequidistantia, angustissime lanceolata, basi attenuata, apici acuminata, 30-32 cent. longa, 15-20 mill. lata, glabra, utrinque subconcolora, supra costulis 3 spinulosis percursa, subtus nuda, marginibus ciliato-spinulosis; spadicis ♀ spathae primariae tubuloso-cylindraceae, in parte superiore aliquantum ampliatae, sparse aculeatae; spathae secundariae elongato-infundibuliformes inermes; spicae ad faucem spatharum callo insertae, patentia, arcuata, 5-7 cent. longa, floribus subdisticis utrinque paucis.—*C. horrens* (not of Bl.) Vidal.

Philippines (Vidal No. 933 in Herb. Kew).

127. CALAMUS PISICARPUS Bl.—*C. oblongus* β. Bl.—*C. verus* (not of Lour.) Mart. . . . . Moluccas
128. CALAMUS ARUENSIS Becc. . . . Aru Islands.
129. CALAMUS HOLLRUNGII Becc. . . . New Guinea.
130. CALAMUS UNIFARIUS H. Wendl. . . . Borneo.
C. UNIFARIUS *v.* PENTONG Becc. . . Nicobar Islands.

131. **Calamus subinermis** H. Wendl. (nomen nudum in Herb. Kew.)—Scandens, robustus, vaginis 4 cent. diam. crases lignosis, apici saccatis, inermibus, indumento tenui cinereo-furfuraceo detergibili tectis, in ore nudis et oblique truncatis; frondes magnae cirro validissimo crebre aculeis reduncis semiverticillatis armato terminatae, petiolo brevi subtus inermi; segmentis magnis 50-60 cent. longis, 5-5·5 cent. latis, non numerosis, subaequidistantibus, elongato-lanceolatis, basi longe attenuatis, apici acuminatis, utrinque sub-

concoloribus, supra costulis 5 spinuloso-setulosis percursis, subtus nudis, marginibus ciliolato-spinulosis.

Borneo (Low in Herb. Kew)*

132. CALAMUS ALBUS Pers. . . . . Moluccas.
133. CALAMUS GRAMINOSUS Bl. . . . . Amboina.
134. CALAMUS NEGLECTUS Becc. . . Malayan Peninsula.
135. CALAMUS ASPERRIMUS Bl. . . . . Java.
136. CALAMUS EQUESTRIS Willd. . . . . Moluccas.
137. CALAMUS CAWA Bl. . . . . Moluccas.

138. **Calamus mucronatus** Becc. sp. n.—Scandens, gracillimus, vaginis 4-6 mill. diam. non flagelliferis inermibus vel spinis brevissimis tuberculiformibus armatis; frondes breves cirro aculeato gracillimo terminatae, petiolo subnullo; segmenta parva perpauca remote inequidistantia alterna vel subopposita, oblanceolata, abrupte acuminato-mucronata, nerves 5 tenuibus percursa, utrinque subconcoloria et in nervis nec non in margine omnino nuda; majora 6-12 cent. longa, 12-16 mill. lata, basilaria basi callosa et reflexa; spadices breves folio breviores non flagelliferi, spathis primariis tubulosis laxe vaginantibus et sursum versus ampliatis, inermibus, spicis parvis scorpioideis.

Borneo; Sarawak (Beccari P. B. Nos. 829, 1904).

139. CALAMUS MELANOLOMA Mart.—*C. anceps* Bl.—*C. calolepis* Miq. . . . . Java.
140. CALAMUS VIRIDISPINUS Becc. . . Malayan Peninsula.
141. CALAMUS ERIOACANTHUS Becc. . . . Borneo.
142. CALAMUS SIPHONOSPATHUS Mart.—*C. discolor* Mart. —Philippines.

143. **Calamus microcarpus** Becc. sp. n.—Scandens; frondes cirriferae, rachi subtus aculeis reduncis armata supra bifaciali et in medio argute spinulosa; segmenta numerosa inaequidistantia, 3-7 approximata, lineari-lanceolata, acuminatissima, 20-23 cent. longa, 12-15 mill. lata, utrinque subconcolora, supra costa media acuta et in utroque latere nervis 1-2, setis paucis rigidis obsitis, percursa, subtus et tantum costa media prope apicem setulosa, marginibus crebre et patule ciliato-spinulosis; spadices partialiter ultra decompositi, spathis tubulosis laxe vaginantibus, basi attenuatis, apici ampliatis, vix spinulosis; inflorescentiis partialibus brevibus, spicis paucis gracilibus zig-zag dispositis ferentibus; fructibus minimis (5 mill. diam.) sphaericis mucronatis, squamis nitidis profunde sulcatis et apice gibbosis.

Philippines (Vidal No. 3952).

144. **Calamus dimorphacanthus** Becc. sp. n.—Gracilis, scandens, vaginis 7-8 mill. diam., spinis inaequalibus gracilibus acicularibus pallide-stramineis densissime armatis; frondes graciles, cirro gracili aculeato terminatae, petiolo brevissimo, rachi sub-biconvexa subtus aculeis reduncis, supra spinis gracilibus acicularibus elongatis, armata; segmenta numerosa subaequidistantia vel interrupte aequidistantia, herbacea, subconcoloria, glabra, lineari-lanceolata, parva (majora 10 cent. longa 4-7 mill. lata) superiora sensim minora, supra in costa media solitaria acuta parcissime spinulosa subtus nuda, ad margines spinulis remotis majusculis ciliata.

Philippines (Vidal No. 3956).

B.—Not scandent.

145. CALAMUS OXLEYANUS Teijsm. & Binn.—*C. Fernandezii* H. Wendl.—*Rotang Pajare* Griff.—*Daemonorops fasciculatus* Mart. . Malayan Peninsula; Bangka; Singapore.

GROUP XV.—*Leaves* of young plant not produced into a cirrus; of the adult shortly cirriferous. *Leaflets* lanceolate or elliptic or in any case with more than 3 primary nerves. *Leaf-sheaths* flagelliferous. *Primary spathes* elongate-tubular, narrow. *Spathellule* of fem. fl. not or very shortly pedicelliform. *Fruiting perianth* pedicelliform. *Seed* not ruminate.

146. CALAMUS MARTIANUS Becc.—*C. penicillatus* (not of Roxb.) Mart. . . . . Penang.

147. **Calamus myriacanthus** Becc. sp. n.—Scandens, robustus; vaginae circ. 4 cent. diam. apici crasse sublignosae, non saccatae, sensim in petiolum validum attenuatae, densissime spinis brevibus acicularibus sparsis, in dorso majoribus et subseriatis, in parte ventrali prope margines longioribus, armatae; frondes amplae, petiolo valido elongato margine aculeis reduncis subregulariter validissime armato, segmentis paucis in parte basilari subaequidistanter remote oppositis, oblanceolatis amplissimis, 40 cent. longis, 7-7·5 cent. latis, subtus cinerascentibus sed glabris nervis 7-8 in pagina inferiore prominulis et contra supra tenuibus percursis, utrinque pilis, setis aut spinulis destitutis; segmentis superioribus alternis, minoribus, apicalibus basi subdecurrentibus, 18-20 cent. longis, 2 cent. latis; spadices ♀ longissimi, spathis primariis arcte tubulosis sparse spinulosis et squamulis ferrugineis obsitis; inflorescentiis partialibus valde elongatis, spathis secundariis tubuloso-infundibuliformibus 2-3 cent. longis, dense spinulosis; spicis alternis gracilibus filiformibus usque ad 15 cent. longis; spathellis brevissime tubulosis; involucrophoro

brevissimo una cum cupula florali discoidea axi lateraliter adnato.—Ut videtur *C. asperrimo* Bl. proximus.

Borneo; Bintulu in Sarawak (Beccari P. B. No. 3698).

148. CALAMUS SPATHULATUS Becc. . Malayan Peninsula.
C. SPATHULATUS *v.* ROBUSTUS Becc. Malayan Peninsula.
149. CALAMUS INSIGNIS Griff . . . Malayan Peninsula.
150. CALAMUS QUINQUENERVIUS Roxb. . . N. E. India.
151. CALAMUS ORNATUS Bl. (type).—*C. aureus* Mart.—*C. ovatus* Reinw. . . . . Java.
C. ORNATUS *v.* HORRIDUS Becc. . Malayan Peninsula.
C. ORNATUS *v.* MITIS Becc. . . . . Borneo.
C. ORNATUS *v.* SUMATRANUS Becc. . . . Sumatra.
152. CALAMUS GIGANTEUS Becc. . . Malayan Peninsula.
153. CALAMUS SCIPIONUM Lour.—*C. micranthus* (partly) Bl.—*C. fissus* (partly) Bl.
—Malayan Peninsula; Borneo; Billiton; Sumatra.

GROUP XVI.—*Leaves* imparipinnate, subcirriferous. *Leaf-sheaths* flagelliferous. *Spadix* contracted. *Primary spathes* tubular at the base; open, dilated and auriculiform above. *Spathellule* of fem. fl. not pedicelliform. *Fruiting calyx* not callous at the base and not pedicelliform. *Seed* with albumen deeply ruminate; *embryo* basilar, excentric.

154. CALAMUS CONIROSTRIS Becc. . . Malayan Peninsula.
155. CALAMUS LOBBIANUS Becc.—*C. melanolepis* Ridley.
—Malayan Peninsula; Singapore.

156. **Calamus brachystachys** Becc. sp. n.—Spadice abbreviato densifloro, spathis primariis basi tubulosis apici auriculato-ampliatis, spinosis, spicis valde approximatis scorpioideis, fructibus in racemo ovato-elliptico congestis inter majoribus, 3·5 cent. longis, 1·5 cent. latis, basi attenuatis, apici conico-rostratis, squamis aterrimis nitentibus, apici rotundato non fimbriato et margine vix erosulo-denticulato, convexis nec medio sulcatis, semine ovato utrinque attenuato-alveolato, albumine profunde ruminato, embryone basilari. —*C. conirostri* proximus.

Borneo; Sarawak (Beccari).

Species of Doubtful Affinities.

157. CALAMUS MANILLENSIS H. Wendl.—*C. maximus* Blanco ?—*Daemonorops manillensis* Mart. . . . . Philippines.

158. **Calamus Harmandi** Pierre MS. (nomen nudum).—Caespitosus? frondium vagina in ventre aperta spinis longis basi confluentibus et irregulariter verticillatis armata ; petiolus supra profunde canaliculatus, subtus rotundatus ad margines spinis rectis horizontalibus armatus ; segmenta numerosa aequidistantia approximata lineari-ensiformia utrinque subconcolora, tricostulata in pagina superiore costa media validiuscula remote setosa et costulis secundariis minute remoteque spinulosis, subtus nervis omnibus nudis, majora 30-40 cent. longa, 10-15 mill. lata, 2 apicalibus basi liberis brevoribus angustissimis ; spadix erectus rigidus, spicis paucis rigidis crassis cylindraceis erectis, 10 cent. longis, undique (per series 6?) floriferis, fructibus (immaturis) parvis obovatis et apici rostratis densissime congestis.—Species anomala floribus in spica multiseriatis insignia.

Cochinchina (Pierre No. 3359 et 1198).

159. CALAMUS THYSANOLEPIS Hance . . . Hong-Kong.

160. **Calamus ferrugineus** Becc. sp. n.—Caespitosus? vaginae spinis solitariis vel aggregato-subseriatis, elongato-laminaribus armatae ; frondes (non cirriferae?) rachi subtus plana et aculeis brevibus in medio armata, supra acute bifaciali ; segmenta aequidistantia numerosa linearia acuminatissima 27-28 cent. longa, 12-15 mill. lata, acuminatissima, apice filiformi, subtus pallidiora, supra costa media nuda, nervo laterali tenui (in utroque latere) setis nigris sparso, subtus in nervis 5 tenuibus minute setoso-spinulosa, marginibus ciliato-spinulosis ; spadix (♀) rigidus breviusculus non flagelliferus undique indumento furfuraceo atro-rubiginoso indutus, spathis primariis tubulosis apicem versus parum ampliatis, dorso carinatis et aculeatis, in ore barbato-ciliatis ; inflor. partialibus brevibus spicis paucis ascendentibus subscorpioideis, floribus approximatis 4-seriatis ; spathis secundariis infundibuliformibus truncatis et margine ciliato-barbatis.—E congerie *C. Reinwardtii*?

Borneo (Lobb in Herb. Calc.); Sarawak (Beccari P. B. No. 563).

161. **Calamus mattanensis** Becc. sp. n.—Scandens, caudicis vaginae 12-17 mill. diam. (non flagelliferae ?) spissis, sublignosis, spinis linearibus anguste lanceolatis, 10-15 mill. longis, horizontalibus, basi supra tumescentibus, subtus concavis et ad latera subdecurrentibus, spinulis minoribus intermixtis, armatae ; frondes majusculae cirro elongato flagelliformi aculeato terminatae, petiolo elongato subbiconvexo vel plano-convexo marginibus et subtus aculeis reduncis robustis armato ; segmenta pauca (17-18) valde inaequidistantia saepe 2-3 approximata, utrinque subnitentia, rigide et spisse char-

tacea, viridi-lutescentia in sicco, lineari-ensiformia, subabrupte acuminata, majora 32-38 cent. longa 2-3 cent. lata, striato-plicato-subquinquenervia, costa media acuta, nervis lateralibus utrinque tenuibus et nudis, marginibus remote et minute tuberculato-spinulosis.

Borneo; Sarawak (Beccari P. B. Nos. 1909, 1930).

162. CALAMUS RALUMENSIS Warb. Bismarck Archipelago.

163. CALAMUS LONGEPINNA Lauterbach . New Guinea.

164. CALAMUS WARBURGII K. Schum. . . New Guinea.

Of the three last recently described species I have seen no specimens.

Doubtful, Imperfectly Known or Unrecognized Species.

C. HUMILIS Roxb. = *C. latifolius* Roxb? . Chittagong.
C. EXTENSUS Roxb. . . . . Silhet.
C. PENICILLATUS Roxb. = *C. javensis* Bl? . Penang.
C. POLYGAMUS Roxb. = *C. flagellum* Griff.? . Chittagong.
C. GRAMINOSUS Bl. . . . . Amboina.
C. EPETIOLARIS Mart. . . . . Java.
C. DISCOLOR Mart. = *C. siphonospathus* Mart.? Philippines.
C. CURAG Blanco . . . . . Philippines.
C. MARITIMUS Bl. . . . . Java.
C. VIMINALIS *v.* REPENS Bl. . . . . Buru.
C. MEYENIANUS Schauer = *C. mollis* Blanco? Philippines.
C. AMARUS Lour. = *C. tenuis* Roxb.? . . Cochinchina.
C. METZIANUS Schl = *C. rivalis* Thw.? . S. India.
C. VERUS Lour. = *Daemonorops* sp.? . . Cochinchina.
C. PULCHER Miq. . . . . Borneo.

Horticultural Names of Calamus or Excluded Species.

C. AMERICANUS = *Desmoncus americanus* Steud. nom.
C. ASPERRIMUS (not of Bl.) Hort.
C. BUROENSIS Mart.
C. COCHINCHINENSIS Hort.
C. CUSPIDATUS Mann & Wendl. = *Eremospatha.*
C. CINNAMOMEUS Hort.
C. DEALBATUS Hort. = *Acantophoenix rubra* Wendl.
C. FARINOSUS Hort.
C. GRANDIFLORUS Pal. de Beauv. (Steud. nom.) = *Ancistrophyllum secundiflorum*?
C. HOOKERII Mann & Wendl. = *Eremospatha.*

C. IMPERATRICE-MARIE Hort.
C. KENTIAEFORMIS Hort.
C. LATISPINUS Hort.
C. LATISPINUS Teijsm. & Binn. in Cat. Hort. Bog. 1866 (name only).
C. LINDENII ? Rodigas.
C. LAEVIS Mann & Wendl. = *Ancistrophyllum.*
C. MAXIMUS (not of Blanco) Reinw. = *Plectocomia elongata* Bl.
C. MACROCARPUS (not of Griff.) Mann & Wendl. = *Eremospatha.*
C. MANNII H. Wendl. = *Oncocalamus.*
C. MICRANTHUS Bl.—Species formed with the leaves of *C. Scipionum* and the spadix of another species.
C. NITIDUS (not of Mart.) Hort.
C. NEWMANNII Hort.
C. NICOLAI Hort.
C. OPACUS (not of Bl.) Mann & Wendl. = *Laccosperma.*
C. PARVIFOLIUS Roxb.—Roxburgh never described a *Calamus* with this name, used by Vidal (Pl. Cum.) = *C. Blancoi* Kunth.
C. PATANENSIS Hort.
C. STOLONIFERUS Teijsm. & Binn. in Cat. Hort. Bog. 1866 (name only) = *C. horrens* Bl. ?
C. REGIS Hort.
C. SECUNDIFLORUS Pal. de Beauv. = *Ancistrophyllum*
C. SECUNDIFLORUS (not of Pal. de Beauv.) Schweinf. = *Calamus Schweinfurthii* Becc.
C. VERSCHAFFELTII Hort. = *Acanthophoenix crinita* Wendl.
C. TRINERVIS Hort. = *Calamus javensis* Bl.
C. ZEYLANICUS (not of Becc.) Hort.
C. ZALACCA Willd. = *Zalacca* sp.
C. ZALACCA Roxb. = *Zalacca* sp.

DAEMONOROPS Bl.

SECTION I.—CYMPOSPATHAE.—*Spadix* fusiform before flowering, then densely paniculate. *Spathes* thin, broad, cymbiform, one or two outer beaked, completely enveloping the inner.

⊙ Stem scandent.

1. DAEMOROPS JENKINSIANUS (*Calamus* Griff.) Mart.—*Calamus nutantiflorus* Griff.—*Daemonorops nutantiflorus* Mart. —N.-E. India ; Tenasserim.

2. DAEMONOROPS MANII Becc . . Andaman Islands.
3. DAEMONOROPS MELANOCHAETES Bl.—*Calamus melanochaetes* Miq. . . . . Java; Sumatra.
   D. MELANOCHAETES *v.* MACROCYMBUS Becc. . . Java.
   D. MELANOCHAETES *v.* MACROCARPUS Becc. . Sumatra.
   D. MELANOCHAETES *v.* DEPRESSO-GLOBOSUS Teijsm. & Binn. . . . . Java?
   D. MELANOCHAETES *v.* MICROCARPUS Teijsm. & Binn. Java?
4. DAEMONOROPS PALEMBANICUS Bl. . . . Sumatra.

5. **Daemonorops singalanus** Becc. sp. n.—Caudex scandens 2·5 cent. diam.; vaginae indumento atro-furfuraceo pro maxima parte obtectae, infra petiolum vix gibbosae et ad latera area nuda notatae in ore antice spinis elongatis erectis, in reliqua parte et ad petioli basin reversis aciculato-laminaribus, saepe basi confluentibus et transverse irregulariter seriatis armatae; petiolus brevis supra planus, subtus rotundatus et in medio nec non ad margines acutos spinosus; rachis in cirrum redunco-aculeatum producta, supra acute bifacialis vix remotissime vel non spinosa; segmenta valde numerosa aequidistantia lineari-ensiformia in caudiculum setosum acuminata, tenuiter chartacea rigidula, majora 25-27 cent. longa, 12-14 mill. lata, supra in costulis 3 acutis setosa, subtus costa media minuta crebreque spinuloso-setosa, marginibus subpatule crebreque ciliatis; spadices ante anthesin elongato-fusiformes longiuscule pedicellati, nutantes, spatha extima in rostrum inerme circiter tertiam ejusdem partem metiens producta, basi longe tubulosa ibique dense spinis erectis, in dorso, superficialiter bicarinato, spinis gracilibus aicularibus filamentoso-complanatis sparsis patulis vel reversis armata; spathae interiores saepe diu persistentes; fructus globoso-subturbinata, basi paullo attenuati apice depressiusculo minute umbonato, squamis luride stramineis linea marginali fuscescente augusta notatis, in medio profunde sulcatis; semine globoso-compresso.

Sumatra; Mount Singalang (Beccari P. S. No. 291).

6. DAEMONOROPS KURZIANUS Becc.—*Daemonorops grandis* (not of Mart.) Kurz . . . . Andaman Islands.
7. DAEMONOROPS GRANDIS (*Calamus* Griff.) Mart. —Malayan Peninsula.
8. DAEMONOROPS TRICHROUS Miq.—*Calamus trichrous* Miq. —Sumatra; Bangka.
9. DAEMONOROPS ANGUSTIFOLIUS (*Calamus* Griff.) Mart. —Malayan Peninsula.
10. DAEMONOROPS FISSUS Bl.—*Calamus fissus* Miq. . Borneo.
    D. FISSUS *v.* CINNAMOMEUS Becc. . . . Borneo.

11. **Daemonorops stenophyllus** Becc. sp. n.—Scandens; caudices vaginati, 2-3 cent. diam.; vaginae infra petiolum vix gibbosae, in ore nudae; caeterum undique spinis complanatis laminaribus e basi lata subulatis, majoribus 1-2 cent. longis, solitariis vel basi confluentibus et subseriatis armatae; petiolus brevissimus vel subnullus; rachis longe cirrifera in dorso aculeis solitariis prope apicem ternis et semiverticillatis armata; segmenta numerosissima aequidistantia angustissima acuminatissima, majora 35 cent. longa, 1 cent. lata, chartacea, supra in costulis 3 tenuibus remote spinulosa, subtus nuda vel costa media spinulis raris obsita, marginibus fere nudis vel remotissime et adpresse spinulosis; spadix ♀ inapertus ventricoso-fusiformis erectus subsessilis; spatharum rostrum nudum et inerme corpus aequans, spatha extima superficialiter bicarinata spinis pollicaribus complanato-laminaribus et e basi lata subulatis saepe pectinato-laciniatis, sparsis, vel interdum basi confluentibus et subseriatis; fructus sphaerici umbonati, 15-16 mill. diam., squamis nitidis luride stramineis, linea intramarginali vix discolore, semine globoso-subdepresso.

Sumatra; Sungei bulu near Padang (Beccari P. S. No. 909).

12. DAEMONOROPS INTERMEDIUS (*Calamus* Griff.) Mart. —Malayan Peninsula.

D. INTERMEDIUS *v.* NUDINERVIS Becc. . Singapore.

13. DAEMONOROPS SEPAL Becc. . . Malayan Peninsula.

D. SEPAL *v.* SPHAEROCARPUS Becc. . Malayan Peninsula.

14. DAEMONOROPS PSEUDO-SEPAL Becc. Malayan Peninsula.

15. **Daemonorops imbellis** Becc. sp. n.—Caudex . .; vaginae . .; frondes non cirriferae (semper?) rhachi subtus rotundata, supra acute bifaciali utrinque omnino inermi; segmenta numerosa concinna aequidistantia anguste ensiformia, majora 35-38 cent. longa, 16-17 mill. lata, acuminatissima, supra in costulis 3 acutis et in nervis 2 secundariis tenuibus, subtus tantum in costa media setoso-spinulosa, marginibus adpresse spinulosis; spadix fructifer pendulus laxe ramosus pedunculo longiusculo (6 cent.), breviter sed argute spinoso, suffultus; fructi majusculi exacte ovoidei abrupte mucronati circiter 3 cent. longi, 2 cent. crassi, squamis nitidis cinnamomeis linea fusca marginatis, in dorso profunde sulcatis; semine globoso 18 mill. longo, 15 mill. crasso.—*D. Sepal* Becc. affinis.

District of Perak, Malayan Peninsula (Scortechini).

16. DAEMONOROPS MARGARITHAE Hance . . Hong-Kong.

17. **Daemonorops Pierreanus** Becc. sp. n.—Caudex erectus 15-20 mill. diam. (?); vaginae fuscescenti-furfuraceae, spinis

nigrescentibus rectis acicularibus et complanato-laminaribus oblique seriatis armatae : frondes bimetrales et ultra non cirriferae (semper?), petiolo subtereti basi spinis seriato-pectinatis armato; rachi in parte media utrinque inermi; segmentis numerosis aequidistantibus lineari-ensiformibus, majoribus 45-50 cent. longis, 2 cent. latis, subulato-acuminatis, supra in costa media acuta et in nervis 2 tenuibus sparse remoteque setosis, subtus tantum in costa media prope apicem spinulosis; spadices inaperti fusiformes erecti, pedicello brevissimo suffulti; spatha extima . . , secunda ovato lanceolata in rostrum tertiam ejusdem partem metiens attenuata, in carinis 2 superficialibus parce spinulosa; fructus sphaerici vel sphaerico-subovati abrupte umbonato-mucronati, 20 mill. longi, 16-17 crassi, squamis per orthostichas 18 dispositis, in medio sulcatis, pallide cinnamomeis, linea intramarginali vix discolore notatis, in margine auguste scariosis et crenulato-erosulis; semine globoso.—*D. petiolari* ut videtur affinis.

Cochinchina; Kuang-Repen Mountains (Pierre No. 4899).

18. DAEMONOROPS LEWISIANUS (*Calamus* Griff.) Mart. Penang.

⊙ ⊙ Stem erect or subscandent.

19. DAEMONOROPS MONTICOLUS (*Calamus* Griff.) Mart. (type). —Mount Ophir (Malayan Peninsula).

D. MONTICOLUS *v.* β Becc. . . . . Penang.

20. DAEMONOROPS PETIOLARIS (*Calamus* Griff.) Mart. (type) —Malayan Peninsula.

D. PETIOLARIS *v.* NUDIPES Becc.—*C. petiolaris* β Griff. —Malayan Peninsula.

21. **Daemonorops microthamnus** Becc. sp. n.—Erectus, caespitosus, parvus; caudices vaginati 1 cent. crassi; vaginae breves tenuiter rubiginoso-fuscescenti-furfuraceae, spinis paucis gracillimis sparsis obsitae, in ore nudae et exacte horizontaliter truncatae; frondes parvulae (15-18 cent. longae) petiolo brevi depresso-ancipite basi vix tumescente inermi; rachi breviter vel abortive cirrifera, subtus in medio aculeis validis semiconicis fere horizontalibus dense et conspicue armata; segmentis utrinque 18-20 concinnis aequidistantibus, linearibus, acuminatissimis, majoribus 5 cent. longis, 3 mill. latis, margine et supra in carina setis paucis obsitis, subtus in costa media ciliato-spinulosis; spadices (♀) folio paullo breviores, erecti, pedicelle brevi suffulti, inaperti ventricoso-fusiformes, rostro inermi corpus ⅓ aequante, spatha extima tantum ad basin acute bicarinata, spinulis gracilibus filamentoso-acicularibus sparsa; fructus

ovoideo-globosi, vertice conico-acuti 15 mill. longi, 12 mill. lati, squamis cinnamomeis apice fuscidulo in margine pallidioribus, in mediosulcatis.—An *D. petiolaris* forma diminuta?

Malayan Peninsula; Perak (Scortechini).

22. DAEMONOROPS TABACINUS Becc. . Malayan Peninsula.

23. DAEMONOROPS CALICARPUS (*Calamus* Griff.) Mart. —Malayan Peninsula.

24. DAEMONOROPS MALACCENSIS Mart.—*Calamus acanthopis* (*Rotang Kertong*) Griff. . , Malayan Peninsula.

⊙ ⊙ ⊙ Anomalous Species.

25. **Daemonorops ursinus** Becc. sp. n.—Scandens; caudices vaginati 15-18 cent. crassi; vaginae infra petiolum vix gibbosae, in ore ocrea in appendicibus longissimis (20-25 cent. long.) angustissimis loriformibus dense crinigeris producta ornatae, caeterum undique spiculis rigidis criniformibus nigris basi in membranulam confluentibus crebreque seriatis indutae; petiolus longiusculus subteres aculeis sparsis brevibus saepe digitatis armatus, adjectis setis criniformibus et una cum rachi, in filamentum vel segmenta diminuta abeunte, indumento furfuraceo-fuscescenti obtectus; segmenta valde numerosa crebrerrima subhorizontalia aequidistantia augustissima acuminatissima membranacea, 10-15 cent. longa, 6-10 mill. lata, supra costulis 3 conspicue crebreque ciliato setosis percursa, subtus costa media setosa, nervis lateralibus tenuibus nudis, marginibus patule ciliato-setosis; spadix parvus petiolo subdimidio brveior, elongato-fusiformis, spatha extima in rostrum tenue attenuata, sparse crinigera, in dorso rotundata nec bicarinata.—Species multis notis insignis.

Borneo; Mount Mattang (Beccari P. B. No. 2925).

26. **Daemonorops (?) intumescens** Becc. sp. n.—Gracilis, scandens; vaginae 10-12 mill. crassae in sicco nigrescentes et minute scabridulae, ochrea elongata (3-4 cent.) tenuiter membranacea inermi marcescente praeditae, spinis sparsis paucis rectis laminaribus 1-2 cent. longis praeditae, apice conspicue gibboso-tumescentes; frondium rachis non cirrifera indumento floccoso-barbato nigrescente obtecta; segmenta valde numerosa herbacea crebrerrima aequidistantia, angustissima, acuminatissima, majora 10-16 cent. longa, 5-8 mill. lata, utrinque in nervis tribus, supra acutioribus, et in marginibus crebre ciliata; petiolus supra profunl canaliculatus ad margines basique spinis rectis armatus, in dorso

vix aculeatus et apicem versus omnino inermis.—Species insignis inter *Cymbospathas* defectu spadicis dubia, vagina in sicco atra, ochrea marcescente elongata et intumescentiis vaginae intus spongiosis inter species mihi cognitas facile discriminanda.

Malayan Peninsula ; Perak (Scortechini).

SECTION II. PIPTOSPATHAE.—*Spadix* narrow-cylindraceous or elongate before flowering, then more or less diffusely branched. *Outer spathes* not completely enclosing the inner.

A.—Spathes *coriaceous, tubular before flowering, the outer hardly shorter than the inner.*

27. DAEMONOROPS MACROPTERUS (*Calamus* Miq.) Becc. —Celebes.

28. **Daemonorops lamprolepis** Becc. sp. n.—Scandens, caudicibus vaginatis circ. 2 cent. diam ; vaginae apice conspicue saccatae, spinis gracilibus numerosissimis fusco-castaneis acicularbus vel tenuiter laminaribus, majoribus 1·5 cent. longis armatae ; frondium petiolus cito biconvexus supra spinis rectis armatus ; rachis cirro elongato gracili et verticillatim redunco-aculeato terminata ; segmenta numerosa aequidistantia anguste ensiformia apice in acumen tenuissimum filiforme vix ciliolatum attenuata, majora circ. 30 cent. longa, 17-18 mill. lata, supra in costa media acuta, marginibus acutis minutissime et adpresse spinulosis, margine inferiore in pagina superiore linea angustissima nitida notato, remote setosa et nervis duobus tenuibus setis brunneis obsitis percursa, subtus nervo medio tantum setoso; spadicis fructiferi erecti, ante anthesin refracti pedunculus gracilis densissime apicem versus spinis fuscis sparsis laminaribus 1-2 cent. longis armatus ; spathae cylindraceae coriaceae deciduae apice densissime setoso-spinulosae, exterior spinulis tenuissimis rigidis acicularibus inordinate obsita ; panicula fructifera ovata 20 cent. longa, fructibus ovoideis obtuse umbonatis, 14-16 mill. longis, 11 mill. latis, squamis pallide stramineis, nitentibus.—*D. macroptero* Miq. affinis.

Celebes ; Kandari (Beccari).

29. DAEMONOROPS NIGER (*Calamus* Willd.) Bl. . Amboina.

B.—Spathes *coriaceous, deep-concave, cymbiform or spoon-shaped, the outer hardly shorter than the inner.* Spadix *densely paniculate.*

30. DAEMONOROPS COCHLEATUS (*Calamus* Miq.) Teijsm. & Binn. . . . . Singapore.

C.—Spadix *narrow-elongate before flowering, then paniculate.* Spathes *at first tubular, then open, all deciduous, or the outer one*

alone persistent and more or less armed with short, stout spines. Leaf sheaths *armed with scattered or serriate spines, never confluent in an annular spinulose crest.*

✣ Mouth of leaf-sheaths naked or armed with scattered spines pointing variously.

⊕ Fruit resiniferous.

31. DAEMONOROPS DRACO (*Calamus* Willd.) Bl. (partly.)—*D. ruber* (not of Reinw.) Mart. . . . . Sumatra.

32. DAEMONOROPS DRACONCELLUS Becc. . . Borneo.

33. DAEMONOROPS MICRANTHUS (*Calamus* Griff.) Becc. —Malayan Peninsula.

34. DAEMONOROPS PROPINQUUS Becc.—*Calamus Draco* (not of Griff.) Willd. Malayan Peninsula; Penang; Sumatra.

35. DAEMONOROPS RUBER (*Calamus* Reinw.) Bl.—*D. accedens* Bl. (excl. var. *brevispatha*) . . . . . Java.

36. DAEMONOROPS MATTANENSIS Becc. . . . Borneo.

37. **Daemonorops Motleyi** Becc. sp. n.—Scandens, mediocris; frondium vaginae spinis laminaribus complanatis sparsis armatae, segmenta anguste lanceolata conspicue et remote aggregata, saepius gemina; spadices erecti breviter pedunculati; spathae exteriores vix interioribus breviores, elongato-fusiformes, spinis brevibus fuscescentibus ad margines fimbriato-filamentosis per series parvas secus carinas 2 superficiales aggregatis; fructus (immaturi) e basi lata ovati abunde resina rubra induti.

Borneo (Motley No. 1103 in Herb. Kew).

38. DAEMONOROPS DIDYMOPHYLLUS Becc. Malayan Peninsula.

39. **Daemonorops sparsiflorus** Becc. sp. n.—Caudices scandentes vaginati 2-2·5 cent. diam., vaginis apice saccatis, spinis valde inaequalibus laminaribus, majoribus 2-3 cent. longis, saepe ad margines fimbriatis basi non vel vix confluentibus saepe oblique subseriatis; frondium petiolus elongatus supra inermis, subtus in medio aculeis 3-nis reduncis et ad margines spinis digitatis armatus; segmenta numerosa crebre aequidistantia linearia vix basi attenuata, superne in acumen tenuissimum attenuato-caudata, majora 24-25 cent. longa, 12 mill. lata, subtus tantum in costa media, supra in costa media et secus nervis duobus fere marginantibus ciliato-spinulosa; spadices sub anthesi paniculati, 40-50 cent. longi, petiolo breve (2-4 cent.) clavato inermi; spathae (post anthesin omnes deciduae) coriaceae, clavato-oblongae, exterior interioribus brevior, 11-14 cent. longa, spinis gracilibus acicularibus barbatis sparsis in carinis confluentibus

armata; spicae 6-7 cent. longae, floribus numerosis spiraliter dispositis, spathellula elongata pedicelliformi suffultis.

Borneo; Labuan (Lobb in Herb. Kew).

⊕ ⊕ Fruit not resiniferous.

40. DAEMONOROPS GRACILIPES (*Calamus* Miq.) Becc.—*Dæm. longipes* (not of Mart.) Miq.—*Calamus accedens* v. *brevispatha* Bl. . . . . Sumatra.

41. DAEMONOROPS LEPTOPUS (*Calamus* Griff). Mart. —Malayan Peninsula.

42. **Daemonorops erinaceus** Becc.—Caudices scandentes, vaginati 2·5 cent. diam.; vaginae apice conspicue saccatae ibique et in ore spiculis brunneis criniformibus dense vestitae, adjectis spinis nonnullis acicularibus longissimis (5-8 cent.), caeterum spinis elongatis angustissimis inaequalibus saepe setiformibus fuscescentibus basi in membranulis cristaeformibus aggregatis et per series appropinquatas obliquas dispositis, armatae, et indumento cincrescente indutae; frondium petiolus breviusculus (25 cent. long.) supra late canaliculatus subtus rotundutus et in medio inermis ad margines spinis validis et longis, minoribus immixtis, inordinate armatus; rachis griseo-furfuracea apice cirro elongato semiverticillatim aculeato terminata; segmenta numerosa crebre aequidistantia angusta 20-30 cent. longa, 13-15 mill. lata, basi valde attenuata, apice longe acuminata, supra in costa media acuta dense spinulosa, subtus nervis 3 tenuissimis dense ciliato spinulosis percursa, et paleolis brunneis minutissimis conspersa, marginibus crebre et acute spinulosis.

Borneo; Sarawak (Beccari).

43. DAEMONOROPS OXYCARPUS Becc. . . . Borneo.

✣ ✣ Mouth of leaf-sheaths armed with long, flat, erect spines; fruit not resiniferous.

44. **Daemonorops microstachys** Becc. sp. n.—Humilis, erectus, metralis; frondium vagina spinis complanatis subhorizontaliter seriatis armata, in petiolum longiusculum supra nudum subtus in medio aculeatum, ad margines praecipue prope basin spinis rectis 2-3 cent. longis patentibus armatum attenuata; rachis non cirrifera; segmenta satis numerosa aequidistanter remotiuscula, anguste lanceolato-ensiformia, supra costa media nuda et nervis duobus setulosis percursa, subtus tantum in costa media ciliolata; spadix gracillimus (± 20 cent. longus) pedicello gracili compresso ad margines spinoso, panicula densa inflorescentiis partialibus paucis, spathis circiter 5, quarum exterior persistens concavo-auriculaeformis elongata, extus

in dorso et ad margines spinis nonnullis armata; interiores planae cito deciduae inermes.

Borneo; Brunei (Lobb in Herb. Kew).

45. DAEMONOROPS HYSTRIX (*Calamus* Griff.) Mart.—*D. hirsutus* Bl.—*Calamus hirsutus* Miq.
—Malayan Peninsula; Sumatra.

46. DAEMONOROPS KORTHALSII Bl.—*Calamus Korthalsii* Miq.
—Borneo.

47. DAEMONOROPS OBLONGUS (*Calamus* Reinw.) Mart.—*Calamus platyacanthus* Mart.—*Daem. platyacanthus* Mart. . . . . Java; Sumatra.

48. DAEMONOROPS ELONGATUS Bl.—*Calamus elongatus* Miq.
—Borneo.

49. DAEMONOROPS DEPRESSIUSCULUS (*Calamus* Teijsm. & Binn.) Becc. . . . . Sumatra.

50. DAEMONOROPS RUMPHII Mart.—*Calamus Rumphii* Bl. —*Palmijuncus verus augustifolius* Rumph . Amboina.

51. DAEMONOROPS CALAPPARIUS Bl.—*D. amboinensis* Miq.—*Calamus calapparius* Mart.—*C. amboinensis* Miq.
Amboina.

52. DAEMONOROPS FUSCUS Mart. . . . Philippines.

53. DAEMONOROPS GAUDICHAUDII Mart.—*Calamus Gaudichaudii* H. Wendl.—*C. usitatus* Blanco —*C. mollis* (not of Blanco) Vidal . . . . . Philippines.

54. DAEMONOROPS RIEDELIANUS (*Calamus* Miq.) Becc. Celebes.

55. DAEMONOROPS KUNSTLERII Becc. . Malayan Peninsula.

56. DAEMONOROPS VAGANS Becc. . . Malayan Peninsula.

D.—Spadix *narrow-elongate before flowering, then paniculate.* Outer spathes *at first tubular, then open, all deciduous or the outer more persistent, not or hardly spinous, but more or less covered with rigid, bristly or needle-like spiculae.* Leaf-sheaths *with spinulose membranous collars or rings.* Fruit *not resiniferous.*

57. DAEMONOROPS CRINITUS Bl.—*Calamus crinitus* Miq.—*C. manicatus* Teijsm. & Binn. . . Borneo; Sumatra.

58. DAEMONOROPS FORMICARIUS Becc. . . . Borneo.

59. DAEMONOROPS MIRABILIS Mart.—*Calamus*? *mirabilis* Mart. . . . . Borneo?; Sumatra?

60. **Daemonorops pseudo-mirabilis** Becc. sp. n.—Caudicis vaginae 2 cent. diam., annulis membranosis conspicue longissimeque setigeris per paria invicem obversis arcte appropinquatis

praeditae (quorum solummodo paria 1-2 apicalia cuniculum completum formantia) adjectis annulis 1-2 minoribus, horizontaliter setigeris, inter copulatos solitariis; frondium petiolus brevis biconvexus angulis obtusis et aculeis reduncis brevibus armatus; segmenta lata, pauca (10-15) per acervulos 3-5 approximatae, in facie superiore nervis 3 vix spinulosis percursa, subtus nudae.—*D. mirabili* proximus.

Cultivated at Buitenzorg, from Palembang in Sumatra.

61. **Daemonorops Forbesii** Becc. sp. n.—Caudices vaginati 12 mill. diam.; vaginae prope apicem annulis 1-2 completis reversis, caeterum annulis minoribus incompletis prope basin interruptis et obliquis ornatae; frondium petiolus biconvexus, angulis obtusis aculeis reversis brevibus armatis; segmenta lanceolato-elongata non numerosa (27) in 3 acervulos appropinquata, in facie superiore nervis 5 setulosis percursa, subtus tantum in costa media setosa; spadix axillaris nutans subpendulus, 60 cent. longus, parte pedicellari aculeata gracili 25 cent. longa, fructibus globoso-ovoideis abrupte umbonata-mucronatis, 2 cent. longis, 18 mill. latis, semine globoso-subcompresso.

Sumatra (Forbes in Herb. Calc.)

62. **Daemonorops annulatus** Becc. sp. n.—Caudices vaginati 15 mill. diam.; vaginae annulis reversis completis late membranosis numerosis (6-7) ornatae; quorum 1-2 superioribus annulis sursum versis appropinquatis et cuniculum clausum (formicarium?) formantibus, praeterea usque ad basin annulis transversis solitariis horizontalibus praeditae; frondium petiolus biconvexus, aculeis reduncis brevibus radis ad margines obtusissimos necnon in dorso armatus; segmenta non numerosa in acervulos 3 valde remotos appropinquata, elongato-oblanceolata, supra 3-costulata, utrinque pilis, setis aut spinulis destituta.

N. E. Borneo; Lawas River (Burbidge in Herb. Kew).

63. DAEMONOROPS SABUT Becc. . . Malayan Peninsula.
64. DAEMONOROPS OLIGOPHYLLUS Becc. Malayan Peninsula.
65. DAEMONOROPS MACROPHYLLUS Becc. Malayan Peninsula.

66. **Daemonorops collariferus** Becc. sp. n.—Caudices vaginati 15-22 mill. diam.; vaginae breves, apice non gibbosae, ibique in ore et seriatim ad petioli basin spinis rectis pallidis longissimis (5-9 cent.) armatae, praeterea annulis setuligeris tantum reversis (4-5), quorum 2 superioribus inter eos valde appropinquatis et late membranosis, ornatae, annulis inferioribus minoribus et saepe

incompletis; frondium petiolus elongatus ad margines spinis rectis binis vel ternis divergentibus armatus; segmenta satis numerosa valde inaequalidistantia et irregulariter appropinquata, angustissima (35-40 cent. longa, 10-15 mill. lata) acuminatissima supra in costa media acuta et in nervis lateralibus tenuibus nuda; subtus in nervis 5 spinulosa.

Borneo; Sarawak (Beccari P. B. No. 1923).

67. DAEMONOROPS VERTICILLARIS (*Calamus* Griff.) Mart. —Malayan Peninsula.

E.—Outer spathe *acutely 2-keeled, keel alone setose.* Leaf-sheaths *armed with flat spines confluent in an annular spinulose crest.*

68. DAEMONOROPS GENICULATUS (*Calamus* Griff.) Mart. —Malayan Peninsula; Penang.

D. GENICULATUS *v.* SPHAEROCARPUS Becc. . Sumatra.

F.—Spathes *membranous, quite smooth;* leaf-sheaths *armed with spinulose crests.*

69. DAEMONOROPS CRISTATUS Becc. . . . . Borneo.

G.—Spathes *more or less coriaceous.* Leaf-sheaths *armed with incomplete annular spinulose crests.*

70. **Daemonorops acanthobolus** Becc. sp. n.—Caudex brevis erectus; vaginae indumento tenuiter furfuraceo-ferrugineo obtectae, lamellis plurimis cristato setigeris (summis quoque spinuli feris), valde obliquis non complete annulariformibus ornatae, apice non saccatae, ibique et in petioli basi ad margines spinis longissimis (10-12 et ultra cent.) armatae; frondium petiolus longissimus supra planus subtus valde convexus; rachis subcirrifera vel in segmentum abortivum dimidiatum terminata; segmenta numerosissima aequidistantia ensiformia basi attenuata in apicem tenuissimum setulosum acuminata majora 30-35 cent. longa, 2 cent. lata, supra nuda vel in costa media prope apicem parce spinulosa, costulis lateralibus tenuibus nudis, subtus in costa media tenui crebrerrime, in nervis duobus remotiuscule ciliolato-spinulosa, marginibus tantum prope apicem remote ciliolatis; parte pedicellari ancipiti inermi, apice non incrassata; spadix circiter metralis decompositus amplus ovato-cupressiformis laxiusculus, decidue fusco-squamuloso-furfuraceus; inflorescentiis primariis plurimis, spicis elongatis (6-8 cent.) disticis onustus, fructibus immaturis globosis umbonato-rostratis.

Borneo; Sarawak (Beccari P. B. No. 22.).

71. **Daemonorops scapigerus** Becc. sp. n.—Caudex brevis erectus; vaginae indumento ferrugineo-furfuraceo obtectae, lamellis

cristato-setigeris valde obliquis non complete annulariformibus ornatae, apice non saccatae, ibique et in petioli basin ad margines spinis longissimis (8-11 cent.) armatae; rachi cirro aculeato gracili terminata; segmenta numerosa aequidistantia, ensiformia, basi attenuata in apicem tenuissimum setulosum acuminata, majora usque 40-42 cent. longa, 2·5 cent. lata, supra nuda vel in costa media acuta prope apicem parce spinulosa, costulis lateralibus tenuibus nudis, subtus in costa media tenui et in nervis duobus inconspicuis minute remoteque ciliato-spinulosa, marginibus nudis vel remotissime, praecipue prope apicem, adpresse minuteque spinulosis; spadicis panicula brevis furfuraceo-pauciramea, pedunculus longissimus (40-115 cent. long.) basi ancipiti ad margines spinis elongatis, apice sensim incrassatus et spinis crebrerrimis saepe seriatis et verticillatis, armatus; spathis primariis chartaceis deciduis inermibus, fructibus immaturis ovatis rostratis.

Borneo; Sarawak (Beccari P. B. No. 22[bis]).

D. scapigerus v. **minor**: humilis, spadice gracillimo pedunculo parcissime spinoso, spicis 2-3, fructibus bene evolutis sphaericis late umbonato-rostratis, 17 mill. diam.

Borneo; Sarawak (Lobb in Herb. Kew).

H.—Spadix *elongate;* outer spathe *lanceolate, slenderly 2-keeled, wholly decidous after flowering.* Leaf-sheaths *armed with isolated or confluent spines not annular crests.*

72. **Daemonorops diversispinus** Becc. sp. n.—Alte scandens; frondium rachi cirrifera; segmenta aequidistantia opposita ensiformia vel anguste lanceolata apice acuminato-caudata, basi ad insertionem fere callosa ibique subtus aculeo incurvo sursum verso praedita; subtus in nervis nuda, supra in costa media sparse setosa; spadicis pedunculus elongatus subtriqueter ad latera spinulosus; spatha exterior membranacea exsucca, nuda persistens lanceolata, spathae interiores deciduae; floris ♀ cupula floralis valde obliqua conspicue lateraliter in pedicellum floris sterilis producta.

Borneo (Lobb in Herb. Calc.).

73. DAEMONOROPS DISSITOPHYLLUS Becc. . . Borneo.

74. DAEMONOROPS PERIACANTHUS Miq.—*Calamus periacanthus* Miq. . . . . Sumatra.

75 DAEMONOROPS LONGIPES (*Calamus* Griff.) Mart.—*D. strictus* Bl.—*Calamus strictus* Miq.
—Malayan Peninsula; Sumatra; Bangka; Billiton.

76. **Daemonorops longispathus** Becc. sp. n.—Caudices vaginati 3-4 cent. diam.; vaginae annulis membranosis destitutae, spinis magnis laminaribus solitariis vel basi confluentibus et per series ± transversas ± interruptas ordinatis armatae; frondium segmenta latiuscula aequidistantia; spadices magni diffusi; spathae cinnamomeae tenuiter coriaceae vel subchartaceae fragiles undique indumento furfuraceo-rubiginoso obtectae, exterior rigida elongato-lanceolata fere plana in dorso carinis 2 valde acutis et spinulosis percursa, post anthesin una cum interioribus minoribus nudis nec carinatis decidua; flores ♂ in spicis disticis laxiusculi, erecto-patuli.

Borneo (Beccari P. B. Nos. 2193, 3697).

77. **Daemonorops ruptilis** Becc.—*Calamus ruptilis* H. Wendl. (nomen nudum in Herb. Kew.)—Robustus; caudicis vaginae ad faucem spinis laminaribus erectis horridae, quarum nonnullis longissimis et latissimis (usque ad 25 cent. long. et 5 mill. lat.); frondium segmenta ensiformia usque ad 60 cent. longa et 3 cent. lata, in apicem filamentosum et setoso-spinulosum sensim attenuata, costa media supra acuta et nuda, subtus superficialis et prope apicem paucis setis longis praedita, nervis secundariis utrinque tenuibus et nudis, marginibus tantum prope apicem spinulosis; spadix robustus, ramis brevibus crassis et ad insertionem subcalloso-tumescentibus, inferioribus divisis, superioribus in spicam elongatam abeuntibus, spathis secundariis et spathellis amplis exsucco-membranaceis castaneis dilaceratis; fructibus in spica 2-4-seriatis oblongis (immaturis) in rostrum attenuatis et stigmatibus magnis crassis reflexis coronatis. —Species insignis *D. longispatho* affinis.

Borneo (Low in Herb. Kew).

G. I. C. P. O.—No. 1065 R. & A.—22-9-1902.—375.—R. B.

FLORA OF THE SUNDRIBUNS.

By D. Prain.

I.—INTRODUCTION.

The investigation of the flora of the Sundribuns has occupied the attention of the officers in charge of the Royal Botanic Garden since 1796, when Dr. Roxburgh,* through his friends Dr. William Carey of Serampur and Dr. Buchanan-Hamilton,† received from this region a number of very interesting plants. The assiduity and success with which the investigation of the Sundribuns was conducted by Roxburgh may be gathered from an examination of the *Hortus Bengalensis* published in 1814; one finds there recorded from the Sundribuns several species, such as *Flemingia congesta, Mezoneuron cucullatum, Bruguiera parviflora, Arthrocnemum indicum, Salicornia brachiata, Dendrobium Pierardi, Pteris vittata,* that have not been collected in the area since his day. The indiscriminate liberality with which the specimens collected during the first half-century of the garden's history were distributed by Dr. Wallich‡ has deprived the Calcutta collection of Roxburgh's specimens, so that all of the species enumerated have to be looked for anew in order that Roxburgh's records may be confirmed. Wallich does not himself appear to have given particular attention to the Sundribun flora though among the Wallichian specimens are examples of an interesting plant§ obtained by him from this area in 1817 that no one has found there again. Dr. Griffith, who

* Superintendent, 1793—1814.
† Superintendent, 1814—1816.
‡ Superintendent, 1817—1845.
§ Hibiscus tortuosus *Wall.* (not *H. tortuosus* Roxb., which is only *H. tiliaceus* Linn.), of which original examples are present in the Calcutta Herbarium; there are also living plants, introduced by Wallich, in cultivation still in the Calcutta Garden.

acted as Superintendent during the absence of Wallich, himself collected in the Sundribuns, and a few of his specimens from the region are present at Calcutta. Dr. Falconer,* who succeeded Wallich, next took the matter up and the collections obtained from the Sundribuns during his incumbency include *Cyamopsis psoraloides*, *Acacia Intsia*, *Asphodelus tenuifolius*, which have not been recorded since. Dr. Thomson † who followed Falconer, also made extensive Sundribun collections which include, among plants not recorded before or since his time, *Allophylus Cobbe*, *Acacia tomentosa*, *A. concinna*, *Vitex trifolia*. Dr. Anderson, ‡ the next Superintendent, did not himself collect in the Sundribuns but Mr. Kurz, § during Anderson's incumbency, made several collections in the area; the only species obtained by him that has not been collected since is *Aldrovanda vesiculosa*, a species already known to Roxburgh and to Thomson as a native of the Bengal plain immediately to the north of the Sundribuns. Mr. Clarke, ‖ who followed Anderson, has given particular attention to the Sundribun flora, his collections include the following species not obtained since his visits to the region:—*Merremia hederacea*, *Coldenia procumbens*, *Teramnus flexilis*, *Lantana triflora*, *Scirpus triqueter* var. *segregata*, *Cladium riparium* var. *crassa*. Sir G. King ¶ kept up the traditional interest of the Calcutta Garden in the flora of the Sundribuns and with the assistance of various friends, but more especially of Mr. Gamble, added considerably to the list of Sundribun species; first, and in two cases only, records dating from the period 1871—1878 include *Mallotus repanda*, *Petunga Roxburghii*, *Bridelia stipularis*, *Desmodium umbellatum*.

Shortly after 1880, Mr. Ellis, then Deputy Conservator of the Sundribun Forests, sent to Calcutta some collections of Sundribun plants, the most interesting of these being *Oryza coarctata*, regarding which, in spite of Roxburgh's very definite account of its appearance and habitat, some misconception had arisen, and *Kleinhovia hospita* which had never been obtained in the Sundribuns before and has not been again reported. These Sundribun plants sent by Ellis were added by Mr. Brace** to a special local Sundribun collection already formed by King between 1871—1880. The knowledge of the Sundribun flora afforded by the material thus accumulated was considerable, but it was recognised that it must be far from complete. How incomplete it was

* Superintendent, 1845—1855.
† Superintendent, 1855—1861.
‡ Superintendent, 1861—1870.
§ Curator of the Herbarium, 1864—1878.
‖ Officiating Superintendent, 1869—1871.
¶ Superintendent, 1871—1897.
** Curator of the Herbarium, 1881—1886.

became apparent when Mr. Heinig was posted to the Sundribuns as Deputy Conservator of Forests ten years later. His duties included the preparation of a working-plan of the Sundribun Forest Reserves; in connection with this duty Heinig sent collections of the important Sundribun species to the Calcutta Herbarium for identification by Sir G. King and by the writer, then Curator of the Herbarium. These collections, though formed with a special and technical object, proved so interesting from the scientific point of view that we begged Heinig to continue his investigations. With this request Heinig complied, and to his collections, carefully made during four or five seasons from 1891 to 1894, is largely due the fact that our knowledge of the Sundribun flora is now perhaps as complete as our knowledge of the Bengal rice-plain itself. During one of Heinig's tours he was accompanied by Mr. G. A. Gammie,* whose enthusiasm as a collector is well-known.

Heinig's interest in the Flora of the Sundribun forests led to his preparing an account of the topography of the Sundribuns and a sketch of the vegetation of their forests; these were incorporated in the working-plan alluded to above. To this Heinig added, as an appendix, based partly on the specimens of his earlier collections, depending partly on collation, a "List of the Trees, Shrubs and Large Climbers" of the Reserved and the Protected Sundribun Forests. The topographical and descriptive portions of Heinig's account have been largely drawn upon in the chapters that follow. The list appended to the working-plan, though important as a contribution to applied Botany, is less valuable from a scientific point of view. Having regard to the purpose of his report as a whole, Heinig's attention was of necessity chiefly given to such species as are of importance from the Forest Officer's stand-point. Its greatest drawback is, however, its inaccessibility. Heinig has also published an interesting account of the root-system of various species characteristic of the Sundri-forests, as apart from the Mangrove-forests, to which allusion will be made in a subsequent chapter.

A few years later Mr. C. B. Clarke, whose personal knowledge of the Sundribuns is also very intimate, provided an excellent account of the topography and vegetation of the Sundribuns. Clarke's sketch of the region took the form of a Presidential address, delivered at the Anniversary meeting of the Linnean Society of London in 1895, and subsequently published in the Society's Proceedings. This second

* Professor of Botany, College of Science, Poona, then officiating as Curator of the Calcutta Herbarium.

account of the Sundribun flora possesses a double advantage over that of Heinig. In the first place it deals not only with the western and central Sundribuns which are under swamp-forest, but with the savannah-swamps of the eastern Sundribuns, a region regarding which we owe to Clarke practically all the knowledge that we possess. Moreover, Clarke's account of the region is readily accessible; that of Heinig forms part of an unprocurable official document. Clarke's paper, however, shares with Heinig's the disadvantage of presenting a list that, though with a different object and in a different manner, is also a selective list. Its purpose cannot be better put than it has been by Clarke himself, who writes:—"This list, containing 69 species, is of course only a portion, perhaps not one-sixth, of the plants which may be collected wild in the Soondrebun. I draw up this list to include those species which I can collect in the Soondrebun, but cannot collect in the Bengal Plain for 100 miles outside the Soondrebun." Clarke's selective list serves the purpose for which it is intended as admirably as does that of Heinig. Both, however,—indeed the two taken together,—fail to provide a complete census of Sundribun plants.

The present paper is the immediate outcome of a visit that the writer, thanks to the kindness of Mr. Lace, Conservator of Forests, Bengal, was able to pay to the Sundribuns during August 1902. An endeavour is here made to convey some idea of the topography of the region, of the nature of the vegetation, and of the origin of the characteristic flora. At the same time the opportunity is taken to provide a census, as complete as the material hitherto available will permit, of Sundribun species. Having regard to the special needs of Forest Officers, to whose efforts, as has been explained, our knowledge of the botany of the region is so largely due, points of economic importance are noted in connection with particular species; a guide to the genera, which it is hoped may be an aid in the identification of these Sundribun plants, precedes this census.

The map accompanying this sketch, which may be usefully consulted in connection with the chapter that follows, and in studying the census of Sundribun species with which the paper concludes, is a reduction from that of Ellison, published in 1873.

II.—TOPOGRAPHY OF THE SUNDRIBUNS.

The region known as the Sundribuns forms the southern part of the Gangetic delta between the Hughli on the west and the Megna on the east. The included area consists of a number of low-lying swampy islands formed by the principal distributaries of the Ganges

and their connecting water-channels and creeks. Along the northern border and particularly at the western end there is a certain amount of clearing and cultivation continuous with the cultivated ground of Central Bengal; in the eastern section of the area, between the Madumati and the Megna, cultivation and clearings extend almost to the sea-face. The central and western portions, except for the gradually extending but still comparatively insignificant amount of cultivated ground along their northern fringe, are occupied by extensive forests; those of the central section, between the Madumati (known within the Sundribun area as the Baleswar) and the Raimangal, being Reserved Forests; those of the western section, between the Raimangal and the Hughli are merely Protected Forests. These three very distinct sections form, from west to east, the southern portions of the districts of the 24-Perganahs, Khulna, and Backerganj, respectively.

The courses and relative position of the Hughli and the Megna are well known to residents of Bengal or, if not familiar, are easily traceable on the map; they need not therefore be described here. The intervening rivers are, however, less familiar; for this reason and also because it is only by forming some impression of the entangled nature of their courses and intercommunications that an adequate idea of the Sundribuns is to be obtained, a brief sketch of their ramifications is here given.*

The *Hughli*, though it forms the western boundary of our area, is not really a member of the Sundribun river-system, and is only incidentally connected with it owing to its giving off at Mud Point an eastern branch known as the Muriganga or the Awatola river which flows southward on the east side of Saugor Island to reach the sea at Dhobelát Island. The first Sundribun river of importance, as we pass eastward from the Hughli, is the *Sabtamúkhi*. This originates near Sultanpur and reaches the sea after a winding course of 50 miles. It is connected with the Muriganga branch of the Hughli by the Gagúdanga Gang and by the Doágra Khal.

The *Thákúrán*, which originates near Jainagar, has also a southerly but less tortuous course of 50 miles before reaching the sea. It increases rapidly in volume on the way and near its mouth is known as the Halúra or Jamerá river. Various khals connect it with the Sabtamúkhi, the principal being the Maral Gang and the Kumária.

* The details of this sketch of the Sundribun river-system are taken from the fuller account of the topography of the region by Heinig, to which it will be necessary to make frequent references in the pages that follow.

Through the Kúltolla Nadi and the Piáli Nadi it is connected with the Calcutta canals.

The *Mátla* is formed close to Canning Town by the junction of the Bidhyadari, the Khuratya, and the Rampura khals. From its point of origin it flows 60 miles to the sea. It is the largest and deepest of the Sundribun streams, being an arm of the sea rather than a river, navigable throughout its course by ocean-going vessels. With the Calcutta canals the Mátla is connected by the Piáli Nadi and the Bidhyadari; with the rivers and channels to the east it is connected by the Rampura Khal and by the Bidda with its many affluents and effluents.

The *Guasábá*, which originates in the net-work of minor channels that lie between the upper reaches of the Raimangal and the Mátla, is the next important stream to the east. It has a course of about 45 miles before reaching the sea; with the Mátla it is directly connected by the Netadupáni.

The *Raimangal*, which separates the district of the 24-Perganahs from that of Khulna and at the same time divides the Protected Forests from the Reserved Forests, has a course of 50 miles from Sahebkhali to the sea. It is connected with the Rampura Khal by the Bárákálágáchya; with the Guasábá by the Terá Banka and the Hari Bhánga; with the Jabúna, the next considerable river to the east, by several streams of which the principal are the Barakúlia, the Kalindi Nadi and the Atthára Banka.

These western Sundribun rivers are not in any instance immediate distributaries of the Ganges; they more resemble long arms of the sea than rivers; they are subject to tidal influence throughout their course, and their waters are consequently more saline than those of the rivers in the central and eastern Sundribuns. The effect of all this is distinctly reflected in the character of the vegetation.

Passing eastward from the Raimangal the next main-river is the *Jabúna* which begins at Kishenganj and after a course of 200 miles joins the Raimangal shortly before the latter reaches the sea. The *Isamati*, soon changing its name to the Molingchu, is the next considerable stream. It begins near Halderkhali and after a course of 50 miles through the Satkhira forest, which constitutes the western half of the central Sundribuns, joins the Barápúnga near the sea-face. The Molingchu and the Jabúna are directly connected by the Fringi, the Aburi, and various other khals.

The *Arpangassia*, formed by the junction, near Burigoálni, of the Kalpatta and the Kobaduc rivers, flows southward for about 40 miles between the Satkhira forest and the forests of the Khulna Reserves.

In its lower reaches this river is known as the Barápúnga; it is joined by the Molingchu just before reaching the sea and is connected with that river further to the north by the Arabibanki, the Golapatti, and various other streams.

Next after the Arpangassia comes the *Sipsa*, a river which originates at Deluti from the union of a number of khals derived from the Kobaduc on the west and from the Bhadder on the east. After a course of 40 miles it distributes itself as the Mandabári, the Moazál, and the Hondurás rivers. These three again unite to form one stream known as the Múrjhata. This Sipsa river-system is connected with the Arpangassia by the Hansurá, the Batlagang and various other channels. The *Bhadder* leaves the Kobaduc at Jhinárgách near Jessore, enters the forest reserves at the northern end of Sútarkháli and from this point has a course of 25 miles before it is merged in the Sipsa.

The *Pussur*, the next important river, is an effluent of the Bhyrah at Khulna; from this point it flows 85 miles to the sea. It is connected with the Bhadder by the Chunkori, the Bajna, the Daodobe, the Laula, the Baráj ongana, the Bori, the Arpangassia,* and the Mángi khals; with the Sipsa it is connected by the Cháila Bogi river. About 20 miles from its mouth the Pussur gives off a considerable river, the Bángárá; this last takes a more direct course, of 16 miles, to the sea, receiving on the way the Kágá, the Baráshiála and the Shella rivers. A perfect net-work of rivers and khals connect these tributaries of the Bángárá with the Pussur on the west and the Bhola on the east; the chief of these are the Khúrma, the Chachan Gang, the Andramoni, the Mrigyamá i, the Shellagang, the Aria Banki, the Char Nangúli, the Pankassia, the Harintáná, the Ghosiángu, the Putia, the Kátá, the Bentmori, the Chandésar.

The *Bhola*, the next main-stream, which begins as a distinct river near Rámpúl, is connected on the north by means of a net-work of khals with the Bhyrah and the Baleswar rivers. After flowing for 40 miles it joins the Pankassia near the junction of that river with the Haringháta.

The *Baleswar*, the next great river, is a direct effluent of the Ganges, the main-stream of which it leaves near Pabna. In the northern part of its course it is known as the Madumati. From Bogi Khal southward it forms the eastern boundary of the reserved forests and separates the district of Khulna from that of Backerganj. In its lower reaches the Baleswar widens considerably and is termed the

* Not to be confounded with the *River* Arpangassia.

Haringháta. With the Bhola on the west it is connected by the Jeodhára, the Chipa Bári, the Daunságar, the Saronkhola, the Sápala; its eastern effluents or affluents, permeating the eastern Sundribuns, are the Kocha, the Haltua, the Bishkhali.

These rivers of the central and eastern Sundribuns, being directly connected with the Ganges, bring down an enormous volume of fresh water, especially during the rains. Their streams are thus less brackish than those of the western rivers, and the character of the vegetation in these divisions of the Sundribuns is thus markedly affected.

The area of this region of interlacing rivers and creeks is about 7,000 square miles; the various water-channels constitute almost one-fourth of the whole, the remaining three-fourths being composed of the low-lying swampy islands which these channels surround. These islands in the eastern or Backerganj Sundribuns are, where not cleared for cultivation, largely occupied by grassy or sedgy savannahs; in the western and central Sundribuns they are mainly forest-clad. The islands are, as a rule, rather higher along the river-banks than they are elsewhere, with somewhat lower and more swampy land inside; as the banks at intervals are cut, and the whole of the interior penetrated and permeated by numberless small creeks, the entire surface of the soil, during the rains and when the rivers are full, is practically under water at every high tide. At low-water during the same season the whole surface is a sheet of somewhat adhesive mud interspersed with shallow pools of standing water. During the cold-season, when the body of water in the rivers is smaller, many of the islands become quite dry, and the superficial mud, which is soft and adhesive when wet, hardens and cakes and cracks on the surface.

This mud is composed of a rather tenacious loam, mixed with a certain proportion of fine sand; the whole, owing to the presence of much humus, is of a bluish-grey tint. The surface of this mud has everywhere a thin coating of river-slime. Near and at the sea-face this mud is at times continued under the lowest tide-level; at times, owing to the action of the waves the slime entirely, and the humus and loam largely, disappear, only the fine sand remaining. The subsoil, as seen at low tide along steep river-banks where erosion is in progress, is also loamy, with here and there patches of almost pure sand—vestiges usually of old sand-banks and river-churs, though doubtless sometimes the remains of a former sea face. Less often smaller pockets of a darker and more tenacious loam, approaching in appearance and consistence though not in composition to a clay, are interspersed

among these sandy patches. This subsoil extends, as borings in the Gangetic delta show, to a depth of 120 feet, where it rests on a fairly uniform layer of semi-fluid mud 40 feet in thickness, which is succeeded by a formation of the same character as that which overlies it.

The heavy flow of water in the larger channels that marks the rainy season frequently causes the erosion of the bank against which a current sets. Banks are thus at times washed bodily away ; more frequently, however, the root-system of the riparian vegetation holds the actual bank in position and the current only undermines it. When the waters fall to a lower level in the cold weather, such banks, deprived of the support supplied by the pressure of the water, often subside bodily into the stream, with the vegetation growing upon them still intact. The submersion to which the trees are subjected during the higher tides of the subsequent monsoon suffices to kill them, but does not necessarily effect their removal, and the obstruction they now offer to the flow of the stream is apt again to alter the set of the current and to lead to a similar attack by the river on another part of its bank. Where erosion of this kind takes place there is not infrequently a coincident and compensating accretion of shelving muddy bank on the opposite and convex side of the river-reach.

Such newly formed banks become covered with grass which serves to bind the mud already deposited and helps to arrest silt and floating seeds. The latter germinate freely and lead to an extension of the forest over the newly formed land. The peculiar root-systems of many of the resulting species help still further to bind the soil and, by arresting more and more silt, to raise the general level of the bank.

The strong storms from the north-west, so prevalent in the Bengal plain from March till May, and the cyclones that occasionally sweep up from the sea of Bengal at the commencement and the close of the south-west monsoon, do considerable damage to the forests by overturning the taller trees, which break those that check their fall. The trees along the coast-line are, moreover, markedly affected by the steady monsoon winds that blow for half the year; they have in consequence a gnarled and bent and stunted habit of growth.

Throughout much of the western Sundribuns, except in the most northerly islands, the vegetation is largely of the mangrove type though even here the mangroves (*Rhizophoraceæ*) are accompanied by Géngwa (*Excoecaria Agallocha*), by Hital (*Phœnix paludosa*) and by Sátári (*Ægialitis annulata*). In the southern islands of the central Sundribuns, where the influence of the tides is strong, the predominance of the mangroves is equally marked. Throughout the

rest of the central Sundribuns and in the northern islands of the western Sundribuns the predominant species is Sundri (*Heritiera minor*)—a circumstance to which the region owes its name of Sundribuns. Associated with Sundri are several characteristic species, notably Amúr (*Amoora cucullata*), Pussur and Dhundol (two species of *Carapa*) and Báen (*Avicennia*), while the river-banks are fringed with various species, the most notable being the Keora (*Sonneratia apetala*). Along the banks too climbing species are most in evidence. Except along the northern borders of the forests, these islands, whether of the Sundri or of the Mangrove class, are remarkably free from dense undergrowth. The savannahs of the eastern Sundribuns are largely composed of Nál (*Phragmites Karka*) though with this are associated several other grasses and a number of tall sedges. Clearings of considerable extent exist throughout the whole of the eastern Sundribuns; in the central and western Sundribuns these are confined to the northern border of the forests. Besides these existing and slowly but steadily advancing clearings there are traces within the forests, and further to the south than any existing cultivation, of former settlements. These vestiges of abandoned occupation, marking perhaps the dwelling-places of salt-makers and Sundribun pirates, are seen in mounds or platforms of higher ground such as may be met with on the left bank of the Mandabari river, not far from Kobaduc, where there are old ruins; another place of the same kind is to be found at Jatta where there are the ruins of an old Hindu temple. The forest in places of this kind is interesting as containing some species, such as the Báel (*Ægle Marmelos*, the Uriám (*Bouea burmanica*), the Gáb (*Diospyros Embryopteris*), the Amaltás (*Cassia Fistula*), that apparently do not occur and possibly could not exist in the swamp-forests; in all probability some of them have, in the first instance, been intentionally introduced.

III.—NATURE OF THE VEGETATION.

When the vegetation of the Sundribuns is considered in more detail, it is convenient at the outset to separate the clearings, whether existing or abandoned, from the swamp-forests. It is true that in the clearings, especially along embankments and on the banks of creeks and khals, a number of the species characteristic of the swamp-forests still persist. Some of them, like *Pluchea indica*, *Pandanus fascicularis*, *Tamarix gallica*, *Flagellaria indica*, *Dalbergia spinosa*, *Clerodendron inerme*, *Premna integrifolia*, *Suæda maritima*, *Acrostichum aureum* are actually more plentiful and luxuriant than they ever appear to be in the forests proper. Moreover, there are

some truly maritime species, such as *Phaseolus adenanthus*, *Stictocardia tiliæfolia*, *Agyneia bacciformis*, *Blumea amplectens* var. *maritima*, *Sphæranthus africanus*, *Azima tetracantha*, *Solanum trilobatum*, *Psilotrichum ferrugineum*, *Cyperus scariosus*, *Fimbristylis polytrichoides* var. *halophila*, *Paspalum distichum*, which are plentiful in the clearings but which one cannot find either in the Sundri or in the Mangrove-forests. A few other species, like *Sesuvium Portulacastrum*, *Zoysia pungens*, *Pycreus polystachyus* occur both in the clearings and at the sea-face. The bulk of the species to be met with in the northern clearings are, however, as will be seen on examining the list of Sundribun plants, either species deliberately introduced by man, or weeds such as accompany his crops, appear in the ponds or ditches that he excavates, or spring up by the sides of his paths and on his rubbish-heaps. The mounds and platforms of higher ground within the forests that mark old settlements, supply a number of species that indicate persistence under favourable conditions, on the sites of abandoned clearings, of species possibly originally introduced. The ruins at Mandabari, examined by Heinig and Gammie, and other similar places where Heinig alone has collected, have yielded a considerable number of species of this class. Having regard to the interest of this question the writer took occasion, when visiting the ruins at Jatta in August 1902, to collect every species that was to be found there; this collection supplies several additions to the list, which includes † *Cratæva Roxburghii*, *Flacourtia sepiaria*, * *Ægle Marmelos*, * *Zizyphus Œnoplia*, † *Eugenia fruticosa*, *Cassia Fistula*, * *Abrus precatorius*, † *Vangueria spinosa*, † *Ixora coccinea* var. *Bandhuca*, *Diospyros Embryopteris*, * *Diospyros montana*, † *Cordia Myxa*, * *Ocimum sanctum*, * *Antidesma Ghæsembilla*, † *Bouea burmanica*, * *Zingiber Casumunar*, *Croton oblongifolius*, *Odina Wodier*. The species in this list marked with an * have been found so far only at Jatta on the mound where there are the remains of a Hindu Temple; those marked with a † have been collected only at Mandabari, or at places of the kind other than Jatta. The remainder, without any distinguishing mark, are common to Jatta and to other ruins. Only one of these species, *Odina Wodier*, has been found in the swamp-forests proper and even there its only locality was a small (and now unused) wood-cutter's camping-ground on the bank of the Ambaria Khal.

The small patch of forest at Jatta on the temple platform and among the ruins yielded the following species in addition to those indicated in the foregoing list:—*Cleome viscosa*, *Tinospora tomentosa*, *Atylosia scarabaeoides*, *Trichosanthes palmata*, *Luffa graveolens*, *Momordica dioica*, *Limnophila gratissima* (from the small sweet-water

temple-tank), *Anisomeles ovata*, *Acalypha indica*, *Trema orientalis*, *Ficus religiosa*, *Ficus infectoria*, *Dioscorea pentaphylla*, *Commelina bengalensis*, *Kyllinga triceps*, *Fimbristylis monostachya*, *Panicum colonum*, *Panicum prostratum*, *Setaria glauca*, and (on the walls) *Adiantum lunulatum*. All of the species here enumerated are plants characersitic of village-shrubberies, hedges and waste-places in the Bengal plain. Except *Luffa graveolens*, which is plentiful in the Upper Gangetic plain, but for which this would appear to be the first record from the deltaic alluvium, all of them are to be found in the districts of the 24-Perganahs and Khulna outside the Sundribuns. Yet none of them have been found anywhere else within the Sundribuns. Their presence in such a spot as the Jatta platform affords evidence of the power possessed by species of this kind, probably mostly casually introduced while the locality was actually occupied, to persist under favourable conditions. Nor could conditions more favourable be readily conceived. The slight degree of artificial elevation given to the site of this old temple, augmented by a further elevation due to the crumbling of the walls of the temple courtyard,* provides a foothold for these species whereon the conditions to which they are accustomed in the Bengal plain are exactly reproduced. Moreover, the tiny platform is separated by many leagues of low swampy land, suitable only for the species characteristic of the Sundri-forests, from the nearest spot on which competing species can well exist and whence invading forms could readily come. If the conditions afforded by the higher and drier ground of the platform are so sharply contrasted with those of the immediate environment as to prevent surprise that these platform plants have not invaded the swamp-forests, this contrast equally explains why the species of the swamp-forests show just as little tendency to overrun the platform. The surrounding forest, therefore, in place of entering into competition with the species to be met with on the artificially raised mounds that indicate abandoned settlements, affords in reality the best safeguard, to such plants as have already become established there, against outside competition.

The extent to which this is the case is better appreciated when the number of species that are common to the Jatta platform and to (*a*) other clearings, (*b*) the sea-face, and (*c*) the swamp-forests is considered. With other similar mounds or platforms within the limits of the Sundribuns the Jatta one shares only *Glycosmis pentaphylla* and *Breynia rhamnoides*. Species of this class that have

* Jatta Pagoda itself is more or less intact and forms a landmark in the navigation of the khals and creeks in its vicinity.

been recorded from other places of the same kind but that are not present at Jatta are also few in number:—*Aphania Danura Zehneria umbellata, Clerodendron Siphonanthus, Bridelia stipularis*, and *Streblus asper* probably exhaust the list. The shortness of this roll, as compared with that of species possibly intentionally introduced, is noteworthy. With existing clearings the Jatta platform shares only *Vitis trifolia, Crotalaria verrucosa, Vernonia cinerea, Hygrophila phlomoides, Pistia stratiotes, Paspalum scrobiculatum*. At the sea-face only four species found at Jatta have been collected; these are *Crotalaria verrucosa, Capparis sepiaria, Ficus Rumphii, Derris scandens*. Only three species, and all of them climbers, are common to the Jatta platform and the swamp-forests; these are *Vitis trifolia* and *Vitis latifolia*, the former common, the latter rare, on river-banks only; and *Derris scandens*, common everywhere throughout the forests from the northern boundary to the sea-face.

Besides those species that are maritime or littoral, which occur in the existing clearings but which one does not find either in the swamp-forests or collect, as Mr. Clarke has put it, "in the Bengal Plain for 100 miles outside the Soondrebun," and in addition to the species which one finds in swamp-forests or at the sea-face but which appear to thrive better in the clearings than elsewhere, there are a number of others that persist in the clearings only along embankments and sides of creeks, but are not there more luxuriant than they are in the forests. As examples may be quoted *Canavalia turgida, Vigna luteola, Derris uliginosa, Pongamia glabra, Cæsalpinia Nuga, Sonneratia apetala, Morinda bracteata, Wedelia calendulacea, Wedelia scandens, Ægialitis annulata, Ægiceras majus, Sarcolobus globosus, Sarcolobus carinatus, Acanthus ilicifolius, Avicennia officinalis, Excoecaria Agallocha*. The majority of the species in existing clearings do not, however, occur in the swamp-forests at all. To a considerable extent they are aquatic species, found in sluggish ditches behind embankments raised to keep out the tides, and in pools or tanks of sweet or only slightly brackish water. The leading examples of submerged aquatics are *Ceratophyllum, Hydrilla, Lagarosiphon, Vallisneria, Ottelia, Ruppia, Naias*, two species of *Utricularia*; of floating water-plants *Pistia, Aldrovanda, Limnanthemum, Panicum Myurus* and *P. proliferum, Chamæraphis, Leersia, Ipomœa aquatica*. Other semi-aquatics, partially submerged or growing in very wet places, are *Hydrolea, Ammannia, Herpestis*, three species of *Hygrophila, Hemigraphis*, two species of *Scirpus*, several grasses, *Ceratopteris thalictroides*. Still another group of semi-aquatics or aquatics affect not pools or jhils or still ditches,

but the edges of rivers, khals or creeks. Among these may be enumerated two species of *Typha*, *Alpinia Allughas*, *Scirpus grossus*, *Panicum repens* and, as a species wholly submerged at every high tide, *Cryptocoryne ciliata*. The species of this group are sometimes to be found penetrating for a short distance into the northern forests, but none of them are truly swamp-forest plants.

Terrestrial species confined to existing clearings are plants either only in cultivation, or escapes from cultivation, or field-weeds. Among those cultivated or occurring as escapes we find *Gynandropsis pentaphylla*, * *Zizyphus Jujuba*, * *Cyamopsis psoraloides*, * *Sesbania grandiflora*, * *Tamarindus indica*, * *Parkinsonia aculeata*, * *Acacia arabica*, *Turnera ulmifolia*, *Trichosanthes cucumerina*, * *Psidium Guyava*, *Calotropis gigantea*, *Solanum argenteum*, *Angelonia grandiflora*, *Ocimum sanctum*, *Ocimum Basilicum*, * *Amarantus paniculatus*, * *Amarantus polygamus*, *Basella rubra*, *Casuarina equisetifolia*, * *Areca Catechu*, * *Cocos nucifera*, *Oryza sativa*, *Andropogon squarrosus*. The species marked * are only found planted; the others are species that have become thoroughly naturalised and in the case of two of these, *Solanum argenteum* and *Angelonia*, this does not appear to be the case anywhere else in India, though *Angelonia* has become similarly naturalised in places in the Irrawaddy delta and near the sea in Tenasserim.

The weeds to be met with in these clearings include *Senebiera pinnatifida*, *Abutilon indicum* and *A. graveolens*, *Malachra capitata*, *Corchorus acutangulus*, *Oxalis corniculata*, *Portulaca oleracea*, *Cardiospermum Halicacabum*, *Crotalaria verrucosa* and *C. Saltiana*, *Phaseolus trilobus*, *Cassia Tora*, *Cucumis trigonus*, *Cephalandra indica*, *Trianthema monogyna*, *Oldenlandia diffusa*, *Vernonia cinerea*, *Ageratum conyzoides*, *Grangea maderaspatana*, *Xanthium spinosum*, *Cnicus arvensis*, *Oxystelma esculentum*, *Dæmia extensa*, *Tylophora tenuis*, *Hoppea dichotoma*, *Coldenia procumbens*, *Ipomœa sepiaria*, *Solanum nigrum* and *S. xanthocarpum*, *Heliotropium indicum*, *Vandellia crustacea*, *Scoparia dulcis*, *Leucas linifolia*, *Amarantus viridis*, *Euphorbia hypericifolia*, *E. hirta* and *E. thymifolia*, *Phyllanthus Niruri*, *Chrozophora plicata*, *Asphodolus tenuifolius*, *Setaria verticillata*, *Andropogon aciculatus*, *Sporobolus tremulus*, *Chloris barbata*, *Eleusine indica* and *E. ægyptiaca*, *Diplachne fasca*, *Eragrostis tenella* var. *plumosa*, *Asplenium esculentum*, *Nephrodium aridum*, *Polypodium proliferum*. This is a meagre list when the area of these clearings is taken into account and may well be incomplete as regards some of the older clearings. The species themselves are, as a rule, unimportant, and the chief interest of the list lies in the indications it affords as to what species first

extend into these newly opened settlements from the Bengal plain, for with only two exceptions these species are all common weeds in the rice-fields or the village shrubberies of Bengal. The exceptions are *Senebiera pinnatifida* and *Xanthium spinosum*, both plentiful weeds near the banks of the Mátla river which do not occur anywhere in the Bengal plain outside the Sundribuns, and both obviously recent introductions to India. It is worth noting, moreover, that among the first species to appear in the newest and smallest settlements are *Ageratum conyzoides* and *Scoparia dulcis*, neither of which is originally a native of India.

Turning now to the Sundribun species that occupy parts which probably have never been subjected to clearing, the first to be considered are those that occur along the sea-face where the line of low sand hills to be met with at various parts of the coast afford conditions very different from those that prevail on the muddy river-banks or in the swampy islands, and provide a foothold for a number of species characteristic of the littoral of South-Eastern Asia generally. The following list includes all that have hitherto been reported ; in all cases where the species occurs elsewhere in the Sundribuns this fact is noted :—

Naravelia zeylanica : also northern edge of forests.

Capparis sepiaria : also among ruins at Jatta.

Tamarix gallica : also river-banks throughout the forests and especially in the northern clearings.

Hibiscus tiliaceus : also general.

Thespesia populnea : planted in the northern clearings ; not found in Sundri-forests.

Vitis trifolia : also general.

Allophylus Cobbe var. *glabra*.

Odina Wodier : planted in northern clearings, also on sites of old settlements and camping-grounds.

Crotalaria retusa.

Crotalaria verrucosa : also northern clearings and old sites.

Crotalaria Saltiana : also northern clearings.

Desmodium umbellatum : general, but rare.

Erythrina indica.

Canavalia lineata.

Vigna luteola : also river-banks generally.

Dalbergia torta : also general.

Derris scandens : also general.

Derris sinuata.

Cæsalpinia Bonducella : also northern clearings and edges of northern forests.

Cæsalpinia Nuga : also general.

Cassia Sophera.

Barringtonia racemosa : also general.

Sesuvium Portulacastrum : also river-banks.

Ixora parviflora.

Launea pinnatifida.

Ipomœa pes-capræ.

Ipomœa longiflora.

Ipomœa illustris : also river-banks.

Dolichandrone Rheedei : also general.

Acanthus ilicifolius : also general.

Lippia geminata : also clearings.

Vitex trifolia.

Vitex Negundo.

Clerodendron neriifolium.

Clerodendron inerme : also general.

Aristolochia indica.

Cassytha filiformis.

Trewia nudiflora : also in northern clearings, wild.

Ficus Rumphii : also on ruins at Jatta.

Crinum asiaticum : also general.

Aneilema nudiflorum.

Pycreus polystachyus : also in clearings.

Cyperus tegetiformis.

Mariscus albescens : occasional on river-banks but most plentiful at sea-face.

Fimbristylis ferruginea : also pretty general.

Fimbristylis sub-bispicata.

Oryza coarctata : also shelving muddy banks of all rivers.

Saccharum spontaneum : also savannahs.

Zoysia pungens : also pretty general.

Of the species here enumerated nearly 40 per cent. occur therefore in the Sundribuns only at the sea-face. More striking still, a considerable number of these species, such as *Crotalaria retusa*, *C. Saltiana* and *C. verrucosa*, *Cassia Sophera*, *Derris scandens*, *Naravelia zeylanica*, *Odina Wodier*, *Ixora parviflora*, *Dolichandrone Rheedei*, *Aristolochia indica*, *Aneilema nudiflorum*, *Cyperus tegetiformis*, *Saccharum spontaneum* are not truly littoral species; they therefore owe their presence here to some agency other than that of ocean currents.

The species of the grassy savannah-swamps are not very numerous and include, among sedges, *Cyperus exaltatus* var. *dives*, *Scirpus grossus*, *Cladium riparium* var. *crassa*; among grasses, Ulu (*Imperata arundinacea*), Kashiya (*Saccharum spontaneum*), Guráná (*Andropogon intermedius*) and especially Nál (*Phragmites Karka* var. *cincta*).

The species of the swamp-forests are by habit sharply subdivided into a smaller group of parasitic or merely epiphytic species that do not come in contact with the mud, and a larger group of rooted species. The parasites include *Cuscuta reflexa*, three species of *Loranthus*, and one *Viscum*. The epiphytes include, *Hoya parasitica*, *Dischidia nummularia*, thirteen species of *Orchidaceæ*, seven epiphytic Ferns, a *Lycopodium* and a *Psilotum*. The purely mangrove forests are usually extensive muddy flats covered at every tide by salt water on which the *Rhizophors* themselves are scattered to make an open forest; the individual trees, owing to their habit of sending down stilted adventitious roots, cover considerable spaces, but leave nevertheless wide intervals between. The mud itself, except for the *Rhizophors*, is often devoid of vegetation, though sometimes patches of two salt-worts, *Arthrocnemum* and *Salicornia*, occur on these muddy slopes. Mud-flats that are covered at high-tide only in the rains, and then necessarily with water that is only brackish, are almost always completely covered by a close crop of *Oryza coarctata*. Steeper muddy banks are more usually covered with seedling Báen (*Avicennia*) and with Hargóza (*Acanthus ilicifolius*) bushes in the central Sundribuns; in the western islands Sátári (*Ægialitis*) is usually associated with and sometimes outnumbers Báen on such banks. The tops of the banks, especially along the larger rivers, are often exclusively occupied by Keora (*Sonneratia apetala*)—most graceful of Sundribun trees and particularly abundant along the convexities of river-reaches. Smaller khals have a more varied riparian vegetation; Ora (*Sonneratia acida*), Báen (*Avicennia*), Dhundol (*Carapa obovata*), Koilshá (*Ægiceras majus*), Dakur (*Cerbera Odollam*), Goria (*Kandelia*), Karanj (*Pongamia*), Bhola (*Hibiscus tiliaceus*), Amanta (*Dalbergia spinosa*)—as frequently erect and shrubby as it is climbing, Gorán (*Ceriops*), Kripa (*Lumnitzera*), Goniári (*Premna integrifolia*), Butráj (*Clerodendron inerme*), Hital (*Phœnix paludosa*), being there especially plentiful. On the side of this riparian fence next to the stream occur frequent patches of Golpátta (*Nipa*) and of the stately grass *Myriostachya Wightiana*. Immediately within this fence is the favourite habitat of Kúmia (*Barringtonia racemosa*), of Gorshingiah (*Dolichandrone Rheedei*) and of Bhaila (*Intsia*). Still narrower channels have frequently only

Koilsha (*Ægiceras*) and associated with it Kedar Sundri (*Brownlowia*) as representatives of the riparian fence. The narrowest creeks of all are often lined, to the exclusion of other species, by a fringe of Golpátta (*Nipa*).

It is on the riparian fence that the climbing species are most plentiful; the commonest is the ubiquitous *Derris uliginosa*, followed in order of frequency by *Finlaysonia*, *Vitis trifolia*, *Dalbergia torta*, *Sarcolobus globosus*, *Parsonsia spiralis*, *Dregea volubilis*. *Derris scandens* at times also occurs here but is more plentiful inside the forests than on their margins; *Finlaysonia obovata* also is not uncommon within the forests, the other creepers rarely occur there.

Just behind the riparian fence occurs any undergrowth to be met with. This consists mainly of Kewa *(Pandanus fascicularis)* with occasional tufts of *Scirpodendron*, clumps of *Crinum*, and bushes of Hargóza *(Acanthus ilicifolius)*. Except, however, in the most northern forests the undergrowth is rarely dense and often there is none. Overhead is the Sundri forest composed mainly of that tree (*Heritiera minor*); of larger size in the central than in the western forests and in the northern islands of either than it is further south. Associated with Sundri on the higher ground is Báen *(Avicennia officinalis)*—the largest of Sundribun trees often reaching 10, sometimes 12-15 feet in girth, and Géngwa (*Excoecaria*), both fairly common; also Shingra (*Cynometra*) which is less plentiful. In the more swampy interior of the islands the companion trees to Sundri are still Géngwa; with it are Kedar Sundri (*Brownlowia*), Amúr (*Amoora cucullata*) and Pussur (*Carapa gangetica*). As we pass southwards the Sundri diminishes in frequency while Géngwa remains, till at length the forests become almost pure Géngwa. By this time, however, the riparian fence characteristic of the Sundri-forest has been replaced by Rhizophors which, as we pass onwards towards the sea, ultimately supplant the Géngwa and give the pure mangrove forest with which we commenced.

Besides the absence of undergrowth, a feature which the Sundri-forest shares with the mangrove- or the Géngwa-forest, the most remarkable feature of the Sundri-forest is the characteristic crop of vertical blind root-suckers, emitted by the roots of various species, notably by those of Sundri itself. The species besides Sundri (*Heritiera minor*) which develop these suckers are Amúr (*Amoora cucullata*), Pussur (*Carapa gangetica*), Ora (*Sonneratia acida*), Keora (*Sonneratia apetala*), Báen (*Avicennia*) and Hital (*Phœnix paludosa*).

In the case of *Phœnix paludosa* the roots, which pass almost vertically downwards, give off numerous branches that pass vertically upwards. The vertical branches are usually small and somewhat inconspicuous, nor do they differ greatly in appearance from the down-

ward growing roots from which they arise. Their structure is, however, peculiar and is apparently adapted to serve a respiratory function.*

The root-suckers of Báen (*Avicennia*), though also small, are sufficiently conspicuous owing to the main roots passing horizontally for great distances from the tree to which they belong and giving off, from their upper side, lines of soft pith-like roots that rise well above the surface of the mud in which the true root is buried. These root-suckers of *Avicennia* are much too soft and flexible to serve either as mechanical supports to the tree or to any great extent as agents in arresting silt and debris. Their chief function appears to be respiratory.

In the case of the remaining species a very decided mechanical effect is produced by these root-suckers. Keora (*Sonneratia apetala*), which is characteristic of river-banks, sends out very wide-spreading roots under the surface of the mud. These roots emit long close lines of root-suckers up to distances of 150 feet or more from the parent stem. The lines of vertical root-shoots act as spurs that deflect the impinging current, lead to accretion of silt, and greatly aid the roots themselves in holding on to the muddy substratum. The shoots that rise from the distal and deeper ends of roots that are nearest to the stream, rise higher and are larger than those on the upper part of the slope and nearer the stem of the tree. In places where the set of a current has become altered, so that the silt thus accumulated is again being removed, it is noticeable that, as the erosion goes on, a deeper layer of roots and root-shoots than the one actually visible at the surface, but belonging to the same tree, becomes bared. These are roots with their suckers that had at some former period become completely buried, when their place was taken by a newer and more superficial system. Roots and suckers thus laid bare after previous complete burial, appear invariably to be dead. The roots of Keora are slender and conical from a rather thick base and are usually quite discrete. Those of Ora (*Sonneratia acida*) are in most respects like those of Keora but are often agglutinated at their bases. In both species they are tough and flexible but not very rigid.

The suckers rising from the roots of Pussur and Amúr, both of which species affect the more low-lying swampy localities in the interior of the islands, are sometimes as much as 3 feet long, the tips of the longest suckers appearing just above the surface of the water at the highest tides. The majority of the suckers hardly reach this level. In both Pussur and Amúr the suckers are cylindric but taper more

* For an account of the structure of these roots a paper by Gage, *On the Anatomy of the Roots of Phœnix paludosa*, in Sc. Mem. Med. Off., Army of India, XII., 103 (1901), should be consulted.

gently than those of Keora, have blunter points and are more rigid and less flexible.

In the case of Sundri the suckers are not so closely set as they are in the two *Sonneratias;* they are also more rigid and less flexible, in this respect resembling the suckers of *Amoora cucullata*. But they differ from all the other root-suckers in being somewhat compressed laterally instead of being cylindric and in arising only at points where the true Sundri roots branch instead of arising in lines along the upper surface. The suckers nearer the stem are moreover wider, *i.e*, have a greater long diameter, than those more remote; the ones nearest the trunk occasionally coalesce with and ultimately form part of the buttresses thrown out at the base of the stem. The root-suckers of Sundri, which prefers to grow on slightly higher ground than Pussur and Amúr, are rarely so long as in these species.* From this fact and from his observations regarding the upper limit of their growth in all the species, Heinig concludes that, besides serving as mechanical supports, these root-suckers in every instance act as respiratory organs. The fact that the roots and suckers of Keora which become completely covered by silt die, and have their places taken by a new and more superficial series of roots and suckers, tends to confirm this conclusion. The conditions under which the species that constitute the Sundri-forests exist are such as to render the suggestion very probable, and the fact that other species, such as Géngwa, are not similarly endowed seems surprising. But in connection with this it is remarkable that though the two *Sonneratias* share the habit, the two *Carapas* do not; moreover, while Sundri (*Heritiera minor*) has root-suckers, another maritime species, *Heritiera littoralis*, not present in the Sundribuns but common on many other Indian coasts, has none.

The extent to which the species characteristic of the Sundribuns accommodate themselves to a greater or lesser degree of brackishness is rather variable. The Rhizophors are plentiful near the coast but some of them, particularly Goria (*Kandelia*), Gorán (*Ceriops*) and Kankra (*Bruguiera gymnorhiza*) are to be found naturally on the banks of the larger rivers even up to the northern boundary of the forests. Their occurrence so far upstream is, however, quite casual, and none of them can be said to extend naturally outside the Sundribuns. Even so near to their natural area as at Calcutta or Chander-

* For an interesting account of the root-suckers of the Sundribuns consult a paper by Heinig in *Journal, Asiatic Society of Bengal*, Vol. 62. pt. 2, p. 158 (1893). In this paper no reference is made to the presence of root- suckers in Hital (*Phœnix paludosa*).

nagore, the only ones that can be got to thrive and to flower are *Kandelia Rheedei* and *Bruguiera gymnorhiza*. Sundri (*Heritiera minor*)—and what is true of Sundri holds good for Amúr, Pussur, Kedar Sundri and Shingra—is to be found everywhere throughout the forests, but it diminishes considerably in size as we pass westward to where the rivers become more æstuarial and carry outward less fresh water, and diminishes still more both in size and in quantity as we pass southward to where the mangroves predominate. It reaches its highest pitch of development and forms a far purer forest in the northern Bagirhat and in the Khulna forests, where the islands are flooded during the rains by the fresh water of streams distributed immediately from the Ganges. While, however, this is the case, Sundri and its companions do not extend northward into the Bengal plain and even so near its proper habitat as Calcutta, it cannot be induced to thrive so well as the nearly allied *Heritiera littoralis* which is, in *its* proper habitat, more tolerant of salt-water than *H. minor*. Géngwa (*Excoecaria Agallocha*), the only species in the Sundribuns that grows with equal vigour in localities suitable for Sundri or for the mangroves, extends naturally into the Bengal plain, and is as healthy and vigorous at Calcutta as it is in its swamp-forest habitat. Keora (*Sonneratia apetala*), which practically ceases southward where the mangroves begin, extends northward a little way into the Bengal plain but only on the banks of tidal rivers and only where the water is distinctly brackish at high tide. The species survives but does not thrive at Calcutta. Hital (*Phœnix paludosa*) does not appear naturally to extend into the Bengal plain, but in spite of this it attains, as a planted species in the Calcutta Garden, to a height of stem surpassing anything to be met with in the Sundribuns. Golpatta (*Nipa*) can be kept alive at Calcutta, but does not there grow vigorously. Amanta (*Dalbergia spinosa*) also extends along river-banks well into the Bengal plain, but the nearly related Panchioli (*Dalbergia torta*) disappears from the banks of the rivers before the northern boundary of the swamp-forest is reached.

A few species seem even more indifferent than Géngwa and extend naturally northwards along river-banks as far as the influence of the tides is felt at all. The best instances of truly littoral species that thus accompany the tide-flow are *Hibiscus tiliaceus*, *Thespesia populnea*, *Erythrina indica*, *Canavalia turgida* (*C. lineata*, though so nearly related, does not), *Phaseolus adenanthus*, *Vigna luteola*, *Derris uliginosa*, *Pongamia glabra*, *Morinda bracteata*, *Stictocardia tiliæfolia*, *Acanthus ilicifolius*.

The 334 species so far reported from the Sundribuns belong to 245 genera and to 75 natural orders. Of these 75 orders no fewer

than 32 are represented by only one genus; while as many as 27 of these 32 have only one species. Other 15 natural orders are represented by only 2 genera; other 7 by only 3 genera; yet another 7 by only 4 genera. Only 2 natural orders, *Scrophularineæ* and *Rubiaceæ*, have 5 genera apiece and 3 orders, *Cucurbitaceæ*, *Verbenaceæ* and *Palmeæ*, have 6 genera. Of natural orders with more than 6 genera, *Orchidaceæ* have 8, *Cyperaceæ* and *Polypodiaceæ* each 9, *Asclepiadaceæ* and *Compositæ* each 11, *Euphorbiaceæ* 14, *Gramineæ* 18, *Leguminosæ* 25. As regards number of species, *Leguminosæ* with 38 species leads; followed by *Gramineæ* with 29; *Cyperaceæ* with 19; *Euphorbiaceæ* with 16; *Polypodiaceæ* with 14; *Orchidaceæ* with 13; *Asclepiadaceæ* with 12; *Convolvulaceæ* with 9; *Cucurbitaceæ* with 7; *Malvaceæ*, *Rhizophoreæ*, *Rubiaceæ*, *Urticaceæ* and *Palmeæ* each with 6; the rest with 5, or fewer than 5.

Of the 245 genera, no fewer than 190 are represented by only one species; of the remaining 55, as many as 35 have only 2 species; other 11 have only 3 species; other 6 only 4 species each; one has 5 species; only two genera, *Ipomœa* and *Panicum* have each 6 species. The subjoined table gives a brief *resumé* of the composition of the Sundribun flora from the taxonomic point of view:—

TABLE I.—*Systematic Synopsis of Sundribun Plants.*

	Orders.	Genera.	Species.
Thalamifloræ	10	18	20
Disciflorae	9	17	21
Calycifloræ	10	46	64
Corolliflorae	19	63	86
Incompletæ	9	30	39
Monocotyledons	15	59	87
Vascular Cryptogams	3	12	17
TOTALS	75	245	334

IV.—ORIGIN OF THE SUNDRIBUN FLORA.

The geographical position and the physical condition of the Sundribuns show that they are only part of the alluvial plain of Lower Bengal, the whole of which is of recent geological formation, and that, as a matter of fact, the process of extension of that plain is here going on under our eyes. Moreover, when borings are made or deep tanks or canals are dug in the Lower Gangetic Plain at a considerable distance to the north of the existing Sundribun forests, a layer of soil is found at no very great depth in which are present the remains of species that now exist in the Sundribuns, but that have retreated from

the actual neighbourhood of the excavation. On the other hand, we find places well to the south of the northern limits of the existing Sundri-forest where, on steep banks that are subject to erosion, a layer of broken bricks and pottery is being exposed at a level well below that of the high tides of the rainy season. Whether these facts, taken in conjunction, indicate that the Sundribun area has been subjected to alternations of elevation and subsidence is an open question. Whatever may be the truth in this respect there is no doubt that all of the surface soil in the lower Gangetic delta is newly-formed land. This being the case, there can be no such thing in the Sundribun forests, savannahs or clearings as an indigenous species. The nature of the flora, with its extraordinary proportion of genera and even of natural families that, so far as this region is concerned, are monotypic, points to the same conclusion. An examination of the Sundribun flora therefore resolves itself into a discussion of the dispersal and the distribution of its species; a study of how and whence the plants now present in the area have been introduced. The simplest method of dealing with the problems involved is to deal first with the dispersal of these species and to commence with those plants that inhabit the swamp-forests and constitute the more characteristic part of the flora. The different possible agencies of dispersal may be accepted as (1) *Human*, by which the introduction may have been (*a*) *intentional*, as in the case of cultivated or planted species, and (*b*) *inadvertent*, as in the case of weeds of fields or waste-places (2) *Bird*, and then either (*a*) by *water-birds* that carry seeds of small size or, rarely, spores attached to their feet, or to the feathers near the base of their bills, along with pellets of mud; or (*b*) by *fruit-eating* birds that void uninjured the seeds of fleshy fruits or seeds provided with a mace: (3) *Wind*, carrying seeds or spores that are sufficiently small and light, or seeds or fruits provided with wing-like expansions, or with a coma or pappus, that may act as a parachute: (4) *River*, bringing down from the Indian Hills or from the Gangetic plain seeds and fruits of various kinds: (5) *Sea*, bringing, by means of currents and tides, the seeds and fruits of, usually, littoral species from other shores.

Swamp-Forests.—Species introduced by man whether by accident or by design, are not to be expected in the swamp-forests: the only unequivocal instance is *Odina Wodier*, a species planted in existing clearings and plentiful where there are vestiges of former occupation; this was also obtained by the writer at a small camping-ground used by wood-cutters on the bank of the Ambaria khal. Nor are species likely to be introduced by water-birds to be expected in these forests; none have so far been found. Species in all probability introduced

by fruit-eating birds are not plentiful; the three species of *Vitis*, with the three species of *Loranthus*, a species of *Viscum*, a *Cuscuta*, a *Ficus* (*F. retusa* var. *nitida*) and the *Leea*, are perhaps the least equivocal instances. Except the *Leea*, which may equally well have been introduced by water, it is to be noted that all these species are either climbers or parasites. The *Ficus*, it is true, does not persistently climb, but it begins life as an epiphytic climber. Species introduced by wind agency are nearly thrice as numerous. They include thirteen epiphytic orchids, *viz.*:—an *Oberonia*, two *Dendrobia*, a *Cirrhopetalum*, a *Trias*, two *Luisiæ*, three *Saccolabia*, two *Sarcanthi*, and a *Cleisostoma*, all with minute and very light seeds; eight epiphytic vascular Cryptogams, *viz.*:—*Asplenium falcatum*, *Polypodium quercifolium*, *adnascens* and *irioides*, a *Vittaria*, a *Drymoglossum*, *Acrostichum scandens*, a *Lycopodium* and a *Psilotum*, all reproduced by means of minute spores. The obscure *Pteris* (*P. vittata*), if one may judge from its figure and description, should belong to this category. The other wind-introduced species are mostly climbers, their seeds being provided with a pencil of hairs that serves as a parachute; they include *Parsonsia spiralis* (Apocyneæ), *Dregea volubilis* and *Finlaysonia obovata* (Asclepiadaceæ) which are rooted in the ground, with two epiphytic Asclepiads, *Hoya parasitica* and *Dischidia nummularia*. The only swamp-forest tree for which introduction by wind seems unequivocal is *Dolichandrone Rheedei*, which has seeds with large membranous marginal wings. One non-epiphytic fern, *Acrostichum aureum*, is possibly also a wind-introduced species.

Species that almost certainly owe their presence in the Sundribun forests to their seeds having been washed down from Upper India or from the Himalayan slopes by the great rivers are less numerous than those introduced by wind-agency. As might be expected they vary considerably in habit and include among herbaceous forms *Alpinia Allughas*, *Typha elephantina*, and *T. angustata*, *Cryptocoryne ciliata* and *Oryza sativa*; among climbers, *Teramnus flexilis*, *Derris scandens*, *Caesalpinia Nuga* *, *Mezoneuron cucullatum*, *Entada Pursætha*, *Acacia concinna* and *A. Intsia*, *Mallotus repanda*, *Ipomœa paniculata*, *Calamus tenuis* and *Dæmonorops Jenkinsianus*; among erect species, *Tamarix gallica*, *Micromelum pubescens*, *Flemingia congesta*, *Acacia tomentosa* and *Cyclostemon assamicus*. The two most striking features among the species of this list, as will be seen on consulting the systematic census of Sundribun plants, are the

* This species is also capable of introduction by the sea, and is plentiful on the coasts of the Andamans: in our northern forests it is, however, possibly a riverine immigrant; at the sea-face, where it also occurs, it is quite probably a sea-introduced species.

extent to which these species are confined to the northern forests only, and the number of them that have been only once reported—often only in the old collections from 1796 to 1856. The latter fact suggests naturally the question whether some of them deserve to be considered truly Sundribun species and whether, though now and again one of them has been met with, all or any of them are capable of persisting in the Sundribuns. The only one that is plentiful throughout the forests is *Derris scandens*; the only one for which the agency is doubtful is the *Cryptocoryne*: not one of them, it will be observed, is a tree of any size.

The rest of the swamp-forest species, 58 in number, are probably all sea-introduced species. For the majority this agency is unequivocal; the case of *Paramignya longispina* appears doubtful, yet it is difficult to imagine any other agency as responsible for its presence. Another equivocal case is that of *Kleinhovia hospita*. This is one of Ellis' discoveries and, next to his rediscovery of *Oryza coarctata*, is the most interesting. Ellis only collected it once and has given no exact locality for his specimens, so that it might be suggested that this is not a swamp-forest species but one of the trees characteristic of the sites of abandoned settlements or even a tree planted in some recent clearing. The vernacular name connoting it is given as Bhola, a name usually applied to *Hibiscus tiliaceus* which, in the shape and venation of its leaves, *Kleinhovia* somewhat resembles. The fact that the vernacular name used should be that properly belonging to one of the most plentiful and familiar of Sundribun species, hardly suggests that *Kleinhovia* is an introduced species; had it been so, some qualifying epithet would almost certainly have been employed by a native wood-cutter or forest official. The indication rather is that the tree is a Sundribun species, but that it is so rare as not to have a name of its own. This use of the vernacular name, coupled with the fact that none of Ellis' other specimens are from existing settlements, practically disposes of the suggestion that his *Kleinhovia* was a planted tree. It was carefully looked for in all the settlements visited by the writer, but was nowhere seen; it has never been sent from any settlement by Heinig; the tree is, moreover, of little economic importance and is not at all a likely species for settlers to introduce. The date of the introduction of the species to Bengal by Roxburgh, who received it from the Moluccas, was 1796, by which time the old settlements of pirates and salt-smugglers in the Sundribuns had either been abandoned or their inhabitants had ceased to hold such intercourse with Calcutta as the introduction of new and rare trees would involve. The suggestion that Ellis' specimens are from some place like Mandabari or Jatta may therefore be ignored. The fruits of

Kleinhovia are well adapted to dispersal by ocean currents; its distribution is very similar to that of *Scirpodendron, Cladium, Brownlowia, Phœnix paludosa, Myriostachya* and other characteristic and well known Sundribun species. The fact that the species was introduced to the Calcutta Garden from the Moluccas by Roxburgh in 1796 is no more an argument against its being wild in the Sundribuns than are the facts that *Intsia* was introduced to the same garden from Singapore in 1835, and *Dolichandrone* was introduced from Southern India in 1830, arguments against these two, which are both wide-spread trees in the Sundribun swamp-forests, being truly wild in our area.

The species introduced by the sea are variable in habit; a few are herbaceous, like *Myriostachya, Scirpodendron, Oryza coarctata, Mariscus albescens, Crinum asiaticum, Salicornia brachiata, Arthrocnemum indicum*; a few are climbers, like *Flagellaria indica, Acanthus volubilis, Ipomœa illustris, Merremia hederacea, Sarcolobus globosus* and *S. carinatus, Dalbergia torta* and *D. spinosa, Derris uliginosa, Canavalia turgida, Mucuna gigantea*; or rambling shrubs, like *Hibiscus tiliaceus* and *H. tortuosus, Paramignya longispina* and *Salacia prinoides*; the rest are erect shrubs, like *Acanthus ilicifolius, Clerodendron inerme*, or trees of smaller or larger size. The most notable feature of the Sundribun swamp-forest flora is that half the species are probably sea-introduced, the balance owing their presence chiefly (1) to wind-agency and (2) to introduction by large rivers; a few have come (3) owing to the agency of frugivorous, but none owing to that of wading birds; only one owes its presence to (4) man.

Grass-Savannahs.—The species that forms the basis of these grassy swamps is *Phragmites Karka* var. *cincta*; this doubtless owes its presence here to wind-agency, which in all probability is also accountable for the presence of *Imperata*, of *Saccharum spontaneum* and perhaps, though in the last instance introduction by rivers is also conceivable, of *Andropogon intermedius* as well. The sedges present cannot well be wind-introduced species, but whether they are to be looked on as introductions by water-birds, by rivers, or by the sea is an open question, since all three agencies of dispersal are conceivable. Having regard to their distribution, however, one may conclude that the *Cladium* is probably a sea-introduced species, while *Scirpus grossus* and *Cyperus exaltatus* may be considered introductions either by means of water-birds or by rivers. The two bulrushes, also found on the margins of such grassy swamps, may similarly be introductions either by water-birds or by rivers; *Acrostichum aureum*, which is also present in such places, may have been dispersed by birds

or by wind. None of the savannah species are likely to have been introduced by fruit-eating birds or by man and, on the whole, the inanimate agencies of dispersal,—winds, river-currents or tides—are the probable agencies for all.

Sea-Face.—The species that constitute the fence of shrubs and creepers immediately behind the line of low sand-hills that occur along the coast wherever the actual shore is subject to the influence of the waves, and the species that are to be met with on these sand-hills themselves, exist under conditions as to light and soil very different from those that prevail in the swamp-forests and, as regards soil at least, quite unlike those offered by muddy banks that shelve under the sea whereon the salt-worts grow, or that exist in the swamp-savannahs. This being the case, it is not surprising to find, as we did in the preceding chapter, that 40 per cent. of the Sundribun sea-face plants are confined to this sea-fence or to these sand-hills.

None of these sea-face plants have been introduced by man, and none are likely to have been introduced by water-birds. Frugivorous birds may, however, be responsible for the introduction of *Capparis sepiaria*, though this is just as likely to have been brought by the sea; of *Allophylus Cobbe*; of *Vitis trifolia*; of *Ixora parviflora*, though this has more probably been washed down from Upper India by one of the rivers; of both species of *Vitex*, though both are common sea-coast species in the Andamans and Burma, and may be here sea-introduced, while, for that matter, *V. Negundo* at least may have been brought down by the rivers; of *Cassytha filiformis*, though this, which is a frequent parasite on *Ipomœa pes-capræ* on Andaman sea-beaches, may have come here by the sea; of *Ficus Rumphii*, though this too may be sea-introduced as it is a very common, indeed almost unfailing denizen of the corresponding sea-fence on the shores of the Andamans. Bird-agency, then, seems unequivocal only in the case of two species. Wind-agency is perhaps unequivocal in the case of *Naravelia zeylanica*, *Dolichandrone Rheedei*, and *Saccharum spontaneum*; it may explain the presence of *Aristolochia indica* though this has more probably been washed down by the rivers, and of *Launea pinnatifida*, though this is more likely to have been brought by the tides.

Species at the sea-face almost certainly washed down by rivers are *Cassia Sophera*, *Tamarix*, *Crotalaria retusa*, *C. Saltiana* and *C. verrucosa*, *Aneilema*, *Lippia geminata*, *Cyperus tegetiformis*; those probably introduced here by this agency are *Odina Wodier*, *Derris scandens*, *Ixora parviflora*, *Aristolochia indica*, *Trewia nudiflora*.

Another species which may have been thus introduced, but which is more probably an instance of introduction by the sea, is *Cæsalpinia Bonducella*, a shrub plentiful behind Andaman sea-beaches The remainder of the sea-face species are probably unequivocal instances of sea-introduction, so that two-thirds of the sea-face flora as against only one half of the swamp-forest flora is of truly littoral type. A few of the species, like *Derris scandens*, *Dolichandrone Rheedei*, *Barringtonia racemosa*, *Acanthus ilicifolius*, *Crinum asiaticum* are to be found within the swampy islands, but the majority of the sea-face plants that are also to be found in the swamp-forests are there strictly limited to the banks of the large rivers. Such species are *Vitis trifolia*, *Desmodium umbellatum*, *Vigna luteola*, *Dalbergia torta*, *Cæsalpinia Nuga*, *Ipomœa illustris*, *Clerodendron inerme*, *Sesuvium Portulacastrum*, *Mariscus albescens*, *Oryza coarctata*. A number of the sea-face plants, however, that find the conditions offered by the swamp-forests uncongenial, recur on the sites of abandoned settlements, along the northern fringe of the forests, or in the existing clearings; examples that may be cited are *Naravelia zeylanica*, *Capparis sepiaria*, *Thespesia populnea*, *Crotalaria verrucosa* and *C. Saltiana*, *Erythrina indica*, *Trewia nudiflora*, *Ficus Rumphii*, *Pycreus polystachyus*, *Fimbristylis ferruginea*, *Zoysia pungens*; the last named is also met with at the upper margins of newly-formed mud-banks not yet afforested by swamp-forest species. One sea-face species, *Saccharum spontaneum*, also occurs in the grassy savannahs.

Abandoned Sites.—In places where there are vestiges of former occupation by salt-smugglers or dacoits or where, as at Jatta, a settled population had at some former time obviously existed, a number of characteristic species are to be found; these have been fully dealt with in a former chapter and, as might be expected from the topography and the physical conditions of such localities, they do not include any species likely to have been introduced by the sea. Nor can rivers be held directly responsible for the introduction of any of the species. Two for which this means of dispersal is conceivable are *Crotalaria verrucosa* and *Derris scandens*, but of these the first is more likely, in places of the kind, to have been inadvertently introduced by man as a field-weed; the *Derris*, though doubtless brought down from Upper India or Assam by rivers in the first instance, has more probably been carried to such spots by wind from the neighbouring swamp-forests. As regards wind-agency too the number of introductions is very small, for even if we consider *Derris scandens* as here *locally* wind-introduced, we have only five species for which this means of dispersal is at all likely, the other four being *Vernonia cinerea*, which is just as likely to be an inadvertently introduced weed; *Dioscorea pentaphylla*,

which may also be a weed ; *Hemidesmus indicus* and, finally, *Adiantum lunulatum* for which this agency is doubtless unequivocal. The inanimate agencies, for these particular sites, count for little as compared with the animate ones.

Water-birds are probably responsible for the introduction of *Limnophila gratissima*, *Hygrophila phlomoides*, *Pistia stratiotes* and perhaps for that of *Paspalum scrobiculatum* and *Panicum colonum*. Fruit-eating birds, however, have been a more active agency and are probably responsible for the presence of *Vitis trifolia* and *V. latifolia*, of *Breynia rhamnoides* and *Bridelia stipularis*, of *Aphania Danura*, *Olax scandens*, *Glycosmis pentaphylla* and *Tinospora tomentosa*, of *Trema orientalis*, of *Ficus Rumphii*, and of the four Cucurbitaceous plants found on these abandoned sites. Other species, possibly thus introduced, though the agency is not unequivocal since all of them may conceivably have been deliberately introduced by man, are *Clerodendron Siphonanthus*, *Streblus asper*, *Eugenia fruticosa*, *Ficus religiosa* and *F. infectoria*, *Antidesma Ghaesembilla ;* perhaps *Flacourtia sepiaria* might be classed with these.

Human agency may be held less equivocally responsible for the deliberate introduction of *Crataeva religiosa*, *Ægle Marmelos*, *Zizyphus Œnoplia*, *Bouea burmanica*, *Odina Wodier*, *Cassia Fistula*, *Vangueria spinosa*, *Ixora coccinea* var. *Bandhuca*, *Diospyros Embryopteris*, *D. montana*, *Cordia Myxa*, *Ocimum sanctum*, *Zingiber Casumunar ;* is not improbably responsible for the presence of *Abrus precatorius*, though this may have been inadvertently introduced ; of *Croton oblongifolius*, the existence of which is not otherwise easily explained ; and of *Streblus asper*, *Flacourtia sepiaria* and *Antidesma Ghæsembilla : Clerodendron Siphonanthus*, too, is a species that may conceivably have in the first instance been planted.

Species that are mere weeds of cultivation elsewhere, and that in these clearings almost certainly owe their presence to inadvertent introduction by man with his crops are *Cleome viscosa*, *Atylosia scarabæoides*, *Crotalaria verrucosa*, *Anisomeles ovata*, *Acalypha indica*, *Commelina bengalensis*, *Kyllinga triceps*, *Fimbristylis monostachya*, *Panicum prostratum* and *Setaria glauca*,—not a very extensive list, the chief interest of which lies in the fact that eight of these species have not been found as weeds in any of the existing clearings. Another possible member of the group is *Vernonia cinerea*, a common weed in existing clearings that may quite readily be a wind-borne species ; still another is *Abrus precatorius*, which, however, having regard to its reputed qualities, is quite likely to have been deliberately introduced. Very nearly half the species in these old settlements must be looked on as having been introduced by man.

Existing Settlements.—In the extensive clearings that occupy much of the eastern Sundribuns, and in the line of constantly encroaching settlements along the northern border of the swamp-forests, the proportion of species introduced by man, whether purposely or by accident, is naturally very much higher than on abandoned sites. Another class of species well represented in such localities is that of plants introduced in all probability by water-birds: this is to be explained by the existence of many still-water ditches behind the embankments that have been thrown up to keep out the high tides, and by the presence of small ponds dug to provide drinking-water for the population. The number of species introduced by fruit-eating birds, on the other hand, is much smaller; this doubtless is to be explained by the absence of trees on which to rest, and the presence of inhabitants, rendering these clearings less inviting as resting places for birds of this kind than are the forests in their vicinity. Of the inanimate agencies, wind has been here the least effective; rivers, as might be expected, have been responsible for the introduction of not a few species that find the conditions in these clearings practically identical with those in the Bengal rice plain whence they have been brought, and that therefore survive here when in the swamp-forests or at the sea-face they can find no foothold. Contrary to expectation, however, it is found that the agency of the sea is responsible for a very marked proportion of the species present in these clearings. This is to a considerable extent due to the survival of swamp-forest species along the banks of khals and on the sides of bunds, and to some extent owing to the fact that these clearings offer conditions suitable for plants growing at the sea-face that are incapable of subsisting in the swamp-forests. The littoral element in the vegetation of these clearings is not, however, to be explained entirely in this way; there are a number of species, very characteristic of sea-shores elsewhere in South-Eastern Asia, which one does not find in the Bengal plain outside the limits of these Sundribun clearings, but which one looks for equally in vain in the swamp-forests or at the sea-face.

Maritime species of this class are *Phaseolus adenanthus*, very plentiful on Andaman beaches; *Stictocardia tiliæfolia*, *Agyneia bacciformis*, *Blumea amplectens* var. *maritima*, *Sphæranthus africanus*, *Wedelia scandens*, *Pluchea indica* and *Suaeda maritima*—both occasionally met with in naturally clear spaces in the forests, *Azima*, *Psilotrichum*, *Solanum trilobatum*, *Cyperus scariosus*, *Fimbristylis polytrichoides* var. *halophila*, *Paspalum distichum*, *Scirpus triqueter* var. *segregata*. Other sea-borne species in open clearings are *Pycreus polystachyus* and *Zoysia*. Species introduced by the sea that survive along bunds and banks of khals in the clearings

are *Canavalia turgida, Vigna luteola, Derris uliginosa, Pongamia, Dalbergia spinosa, Cæsalpinia Nuga, Sonneratia apetala, Morinda, Ægialitis* and *Ægiceras,* the two *Sarcolobi, Acanthus ilicifolius, Clerodendron inerme, Premna integrifolia, Avicennia officinalis, Excoecaria, Flagellaria, Pandanus fascicularis.*

Species in clearings that have been introduced by rivers include *Tamarix gallica, Cæsalpinia Bonducella* probably, *Barringtonia acutangula, Conyza semipinnatifida, Wedelia calendulacea*—though this might equally well be an introduction by water-birds, *Ipomœa sepiaria, Lantana indica* and *L. trifolia, Lippia geminata* and *L. nudiflora, Trewia nudiflora, Casuarina equisetifolia,** two species of *Typha, Cryptocoryne, Cyperus exaltatus, Scirpus littoralis, Panicum repens.* Wind-introduced species in the clearings include *Vernonia cinerea* and *Ageratum conyzoides,* though both these might have been introduced as weeds with crops; *Grangea maderaspatana* and *Cnicus arvensis,* to which the same remark will apply; *Oxystelma esculentum, Dæmia extensa, Tylophora tenuis, Pentatropis microphylla, Imperata arundinacea, Chloris barbata, Asplenium esculentum, Nephrodium aridum, Polypodium proliferum, Acrostichum aureum, Helminthostachys zeylanica.*

Fruit-eating birds are possibly responsible for the introduction of *Passiflora suberosa, Cephalandra* and *Cucumis,* and almost certainly responsible for the presence of *Vitis trifolia*; they are also in all likelihood responsible for the dispersal in a wild state of *Basella,* but the influence of this agency is necessarily slight and cannot be associated with any other species. Water-birds, on the other hand, have to be credited with the introduction of all the fresh-water submerged or floating species enumerated in the previous chapter except *Ipomœa aquatica,* which is almost certainly a plant originally deliberately introduced. Besides these this agency probably explains the presence of *Hydrolea, Ammannia, Herpestis,* three *Hygrophilæ, Hemigraphis, Eleocharis,* one *Scirpus, Paspalum scrobiculatum, Eriochloa polystachya, Panicum Crus-galli* and, perhaps, *Diplachne fusca.*

Species intentionally introduced by man and still either under cultivation or existing as escapes have been already given in detail. The number of these species is not very great and the list is probably incomplete. The rest of the plants to be met with in clearings are weeds in all probability inadvertently introduced by man. The number of these weeds is by no means great, when the extent of the cleared area is considered, and hardly exceeds that of species

* See remarks regarding this species in the systematic census.

whose presence is almost certainly due to the tides and ocean-currents. The subjoined table gives a synopsis of the facts detailed in the foregoing paragraphs.

Table II.—Mode of introduction of Sundribun Plants.

Species introduced by / into	Animate Agencies.				Inanimate Agencies.		
	Man.		*Birds.*		*Winds.*	*Rivers.*	*Tides.*
	Intentionally.	Inadvertently.	Aquatic.	Frugivorous.			
Existing clearings	23	56	29	4	15	19	36
Abandoned settlements	16	10	5	20	5	...	...
Grassy savannahs	...	...	...	...	4	5	1
Swamp-Forests	1	...	...	10	32	21	58
Sea-face fence	...	...	...	2	3	11	31
Total, eliminating overlapping of species in different areas	36	58	30	23	50	41	96

The concluding portion of this enquiry into the origin of the Sundribun Flora involves a brief review of the distribution of the species in order to determine whence these have come into the region.

When those species that have possibly been originally introduced intentionally are considered, we find altogether 36 distributed as follows :—

Both westward and eastward from the Sundribuns		31
Cosmopolitan in the Tropics	5	
Tropics of Eastern Hemisphere, Australia, Polynesia	2	
Tropics of Eastern Hemisphere, Australia	4	
Tropics of Eastern Hemisphere	1	
South-Eastern Asia, America (*Parkinsonia*)	1	
South-Eastern Asia, Australia	3	
South-Eastern Asia (India, Indo-China, Malaya)	11	
India, Indo-China	4	
Eastward only to Indo-China and Malaya (*Bouea*)		1

Westward only		4
India, Africa (*Acacia arabica*)	1	—
India only (*Cyamopsis, Ægle, Ficus religiosa*)	3	

With the solitary exception of *Bouea*, which is very rarely cultivated in Eastern Bengal, all of the species in the list are familiar plants in the Bengal Plain immediately to the north of the Sundribuns. This fact, taken in conjunction with the circumstance that for at least 10 per cent. of the species the introduction can only have been from the north, points to the conclusion that all the planted species, except perhaps *Bouea*, have been introduced from Bengal.

This conclusion is somewhat strengthened when the distribution of the introduced weeds is considered, for it may be safely assumed that inadvertently introduced species must in most cases have accompanied the deliberately introduced ones. The 58 weeds present we find to be distributed as follows :—

Both westward and eastward		51
Cosmopolitan in the Tropics	24	—
Tropics except Australia	2	
Tropics except Australia and Polynesia	3	
Tropics except Polynesia	1	
Tropics of Eastern Hemisphere, Australia, Polynesia	1	
Tropics of Eastern Hemisphere, Australia	2	
Tropics of Eastern Hemisphere, Polynesia	1	
Tropics of Eastern Hemisphere	10	
South-Eastern Asia, America	1	
South-Eastern Asia, Australia, Polynesia	3	
South-Eastern Asia, Australia	1	
India, Indo-China	1	
India, Chittagong	1	
Westward only		7
America only	3	—
America, Africa	1	
Africa, India	1	
Europe, India	1	
Europe only	1	

The weeds, as might be expected, are much more cosmopolitan than the cultivated species (about 50 per cent. in place of 12 per cent.) and the localised, purely South Eastern Asiatic weeds are fewer than the localised, purely South Eastern Asiatic planted species (about 4 per cent. in place of about 40 per cent.). In the case of the weeds there are no species distributed to the east but not to the west, while

as many as 12 per cent. are distributed to the westward of the Sundribuns only. Every thing therefore indicates that the species introduced by human agency have come from the north and west.

The species possibly introduced by water-birds are 30 in number, distributed as follows :—

Both westward and eastward		27
Cosmopolitan in the Tropics	10	—
Tropics of Eastern Hemisphere and Australia	4	
Tropics of Eastern Hemisphere	1	
South-Eastern Asia, Australia, America	1	
South-Eastern Asia, Australia	3	
South-Eastern Asia, Europe	1	
South-Eastern Asia	3	
Australia, Europe	1	
India, Indo-China	3	
Westward only		3
India, Africa	1	—
India	2	

The high percentage of cosmopolitan species brings plants of this group almost on a parallel with the introduced weeds. Here again none of the species are distributed to the eastward only; the species distributed to the westward only constitute 10 per cent. of the whole; it may therefore be concluded that these bird-introduced species, like the species introduced by man, are immigrants from the north.

When the 23 species, for which dispersal by fruit-eating birds is almost certain, are considered, we find a great contrast in their distribution since none of them are cosmopolitan, and more than half of them are confined to South-Eastern Asia (India, Indo-China, Malaya). The details are :—

Distributed both westward and eastward		21
To Africa and throughout South-Eastern Asia	3	—
Throughout South-Eastern Asia and to Australia	5	
Throughout South-Eastern Asia and to New Caledonia	1	
Throughout South-Eastern Asia	8	
Throughout India and Indo-China	4	
Distributed westward only (*Loranthus longiflorus*)		1
Distributed eastward only; to Eastern Bengal north of the Sundribuns, and to Assam (*Loranthus Scurrula* var.)		1

If one may judge by the predominance of species that pass beyond South-Eastern Asia to Northern Australia and New Caledonia, over those that extend beyond South-Eastern Asia to Africa, we can

suppose that the pendulum-like bird-migrations which alternate with the monsoons throughout the submeridional ranges of hills and islands of Eastern Asia, are chiefly responsible for the introduction of such species into the Sundribuns. The figures, though too meagre to be conclusive, are not contrary to this deduction, which is in keeping with observed facts as regards the Andamans.

Passing now to the various inanimate agencies of dispersal, we have first to deal with species that are introduced by wind. Space forbids an examination in minute detail of the features of distribution of each of these plants, the requisite data for which are, however, given in the systematic census. It is sufficient here to say that they may be divided into four natural groups: (*a*) those with light spores (Vascular Cryptogams), of which the epiphytic forms either are cosmopolitan or are at least widely disseminated in the Old World and the terrestrial are at least widespread in South-Eastern Asia; (*b*) those with seeds or fruits of some size provided with a feathery pappus, a coma, or some equivalent arrangement,—again either cosmopolitan or, at least, widespread in South-Eastern Asia; (*c*) those with seeds provided with wings, of which we have but two examples, a *Dolichandrone* widely spread in South-Eastern Asia, and a *Dioscorea* that is found everywhere in the tropics of the Eastern Hemisphere; lastly, (*d*) those with very small and light seeds (Orchids) apparently exceedingly well adapted for dispersal by winds but nevertheless with often a remarkably localised distribution. The general features of the distribution of the 50 species of the class are:—

Distributed both westward and eastward		35
Cosmopolitan in the Tropics	6	—
Tropics of Eastern Hemisphere, Australia, Polynesia	1	
Tropics of Eastern Hemisphere, Australia	3	
Tropics of Eastern Hemisphere, Polynesia	3	
Tropics of Eastern Hemisphere	3	
South-Eastern Asia, Northern Australia, Polynesia	1	
South-Eastern Asia, Northern Australia	2	
South-Eastern Asia, Melanesia	1	
South-Eastern Asia	11	
India, Eastern Himalaya, Indo-China	3	
India (Circars), Tenasserim	1	
Distributed eastward only		10
Indo-China, Malaya, Northern Australia	1	—
Indo-China, Malaya	1	
Eastern Himalaya (Sikkim) and Indo-China	6	
Indo-China	2	

Distributed westward only (India and Ceylon) . . .	2
Undistributed (*Oberonia Gammiei, Cirrhopetalum Roxburghii, Pteris vittata*)	3

The number of Indo-Chinese species that the Sundribuns share with Sikkim, which cannot, however, be regarded as a western region, is rather striking. It is not a little remarkable that three of the species not hitherto collected anywhere except in the Sundribuns should be species of a class eminently adapted for dispersal by means of an agency so constantly active in the area as wind.

The distribution of the 41 probably river-borne species does not call for detailed analysis, and the only remarks that have to be made regarding them turn on the question as to whether their presence in the Sundribuns is due to their having been brought down by the Ganges or the Brahmaputra. The topography of the region indicates that in most cases the Ganges is more likely to have been the agent, though with a number of the species either river may have been responsible, while there are a few species, such as *Micromelum pubescens*, *Teramnus flexilis*, *Eugenia fruticosa*, *Conyza semipinnatifida*, *Lippia geminata*, *Pandanus fœtidus*, *Dæmonorops Jenkinsianus*, *Cyperus inundatus*, that, having regard to their known distribution and in some cases also to their actual locality in the Sundribuns, we must believe to have been brought down by the Brahmaputra and not by the Ganges, if this means of dispersal be really responsible for their presence in our area. One species, moreover, for which the writer assumes tentatively this means of dispersal offers some difficulty. This is *Cryptocoryne ciliata*, a species very plentiful in Lower Bengal and one that is carried about in this particular manner, by upward-flowing tides: it is, however, fair to remark as well as by falling ones. The difficulty lies in the fact that this *Cryptocoryne* is confined to Lower Bengal, so far as India is concerned, and as it is also a Malayan species, the question arises whether it may not really be, as Mr. Clarke considers, a characteristic Sundribun plant, the presence of which in India is due to introduction by the sea. The objection to this conclusion is, after all, only that it does not appear to enter the Sundribun forests, or to establish itself in our area till clearings have been effected—a not insuperable objection when the case of species like *Blumea amplectens* var. *maritima*, *Paspalum distichum*, *Fimbristylis polytrichoides* var. *halophila*, *Solanum trilobatum*, *Azima tetracantha*, *Psilotrichum ferrugineum*, *Agyneia baccifermis* and *Sphæranthus africanus* are considered. The great difference between the *Cryptocoryne* and these other species lies in its submerged habit; it is easy to understand why the other species mentioned should find the conditions of the swamp-forests inimical to their welfare;

there is no obvious reason why *Cryptocoryne* should decline to establish itself on the banks of muddy creeks before the forest disappears and yet do so profusely wherever a clearing has been effected.

The most interesting part of the enquiry into the distribution of the Sundribun species is that which concerns the sea-borne plants to be met with in the swamp-forests, at the sea-face and, to a less but still an appreciable extent, in the northern clearings. The subject has already been very fully and instructively dealt with by Mr. C. B Clarke* so that here only the briefest summary is necessary. It is sufficient to say that the results of an examination in detail of their distribution indicate that to a greater extent than even with the wind-borne element in the Flora, these species are of Malayan and not of Indian type. The distribution of the 96 species of this kind is summarised as follows :—

Distributed both westward and eastward		63
Cosmopolitan on tropical coasts	12	—
Coasts from America to Malaya	1	
Coasts from Eastern Africa to Polynesia	4	
Coasts from Eastern Africa to Northern Australia	1	
Coasts from Eastern Africa to Malaya	6	
Coasts from Eastern Africa to Malaya but not on those of India or Indo-China	1	
Coasts from Mascarenes to Polynesia	3	
Coasts from Mascarenes to Polynesia but not on those of India or Ceylon	1	
Coasts of Mascarenes, Coromandel and Java	1	
Coasts from Malabar to Polynesia	6	
Coasts from Malabar to Polynesia but not in Coromandel	2	
Coasts from Malabar to Australia	2	
Coasts from Malabar to Australia but not in Coromandel	1	
Coasts from Malabar to Malaya	11	
Coasts from Malabar to Malaya but not in Coromandel	5	
Coasts from Malabar to Indo-China	1	
Coasts from Malabar to Indo-China but not in Coromandel	1	
Coasts of Ceylon, Indo-China, Malaya, Australia	1	
Coasts of Ceylon, Malaya, Australia, Polynesia	1	
Coasts of Coromandel and Indo-China	1	
Coasts of Coromandel and China-Japan	1	
Distributed only eastward		23
Coasts eastward to Polynesia	2	—
Coasts eastward to Australia and New Guinea	3	

* Proceedings, Linnean Society of London, 1894-95, pages 14—29

Coasts eastward to Southern China and Malaya .	8	
Coasts of Malaya only	4	
Coasts to Tenasserim only	6	
Distributed only westward		7
Coromandel to Eastern Africa	1	
Coromandel to Eastern Africa but not in Malabar	1	
Coromandel, Ceylon	1	
Coromandel only	1	
Ceylon only	2	
Scinde only	1	
Not reported from elsewhere than the Sundribuns (*Hibiscus tortuosus, Carapa gangetica, Psilotrichum ferrugineum.*)		3

The Flora to which nearly all except the seven species that are distributed only westward belong, is the Malayan 'Strand-Flora,' composed of littoral species that characterise every shore from Melanesia to the Mascarene Islands. Its natural area includes the shores of the various archipelagos from Vavau to Fiji, from New Caledonia to the Carolines ; the shores of the Philippines, of northern Australia, of New Guinea and the other *quasi*-Malayan Islands that lie to the east of the Wallace line ; of the Malayan Archipelago and Peninsula ; of Ceylon ; of Madagascar, Mauritius, the Comoro Islands, the Seychelles. At various points offshoots of this flora branch (*a*) into Polynesia, less marked perhaps than any ; (*b*) from Ceylon north-westward along the coast of Malabar and the Concan, where the presence of this factor in the vegetation, though more marked than on Polynesian coasts, is not so strong as in other outlying portions of its domain ; (*c*) to the east coast of Africa where the element is more strongly represented than in Malabar but is still not overwhelmingly strong ; (*d*) northward along the shores of Cochin-China and Tonkin as far as the coasts of Southern China and Formosa, a few species even reaching Liu-kiu ; and (*e*) strongest offshoot of all, northward along the coasts of Tenasserim and the Andamans to Arracan, Chittagong and, as our list shows, into the Sundribuns at the head of the Bay of Bengal, with the result that though certainly the most outlying part of its whole domain, this Sundribun area exhibits the features characteristic of the Flora in question on a scale and to a degree nowhere surpassed. The remarkable paucity of members of this flora on the Coromandel coast, which has nevertheless a distinctive littoral vegetation of its own, is well shown by our summary, since besides the 23 species that extend only eastward from the Sundribuns, 13 of those that extend also to Ceylon, Malabar, the Mascarenes or Africa are absent from Coromandel, as are 3 of those that are only of westward distribution ; thus 42 out o

96 or $\frac{7}{16}$ of the sea-borne plants of the Sundribuns are absent from the Coast of Coromandel. Nor is this quite all; of the littoral species found only in the northern clearings, three-fourths, and of the littoral species found only at the sea face, three-fifths are species that occur on the Coromandel Coast, while both the saltworts, which affect muddy slopes covered by every tide, are also Coromandel plants. The proportion of species that occur within the Sundribun forests proper but are not to be found on the Coast of Coromandel is thus appreciably increased and exceeds 50 per cent. of the characteristic Flora.

V.—GUIDE TO THE GENERA.

An attempt is made in the following guide to the genera of plants that occur in the Sundribuns to provide a key sufficiently simple for use by Forest officers and their subordinates at most seasons of the year.

In using this key it is essential that in each case *both* the contrasting statements given for one of the numbers on the left-hand side of the page should be carefully read before deciding to which of the two categories a plant belongs. This done, the number printed in italics against the categorical statement on the right-hand side of the page carries the student to the proper passage. For example, a species is found to possess flowers; we pass to 2: it is not a grass or a sedge; we pass to 29: it is not a floating or submerged aquatic; we pass to 44: it is neither epiphytic nor parasitic; we pass to 59: it has no tendrils; we pass to 71: the leaves are not gland-dotted; we pass to 81: the leaves have distinct leaf-blades; we pass to 83: the leaves are compound; we go on with 84: they are opposite; we pass to 124: the leaflets are digitate; we know the plant to be a *Vitex*. Which *Vitex* it is we learn on turning to the 139th genus in the *Systematic List* where the differential characters of the species of this genus hitherto met with in the Sundribuns are given.

1. Plants with distinct flowers *2*
   Plants without flowers (*Ferns* and *Fern-Allies*) . . *237*
2. Plants with grassy stems; leaves with a distinct leaf-sheath, sometimes only the sheath present; flowers in spikelets in the axils of glumes (*Sedges* and *Grasses*) . . *3*
   Plants with woody or herbaceous stems, or if the stems grassy (*Bulrushes*) the flowers then not in spikelets . *29*
3. Leaves 3-ranked, rarely without leaf-blades, the sheaths closed in front; fruit a small nut with the seed free inside; flowers with a glume only (*Sedges*) . . *4*

Leaves 2-ranked, the sheaths open in front and with a ligule at the top behind; fruit a grain with seed adnate to pericarp; flowers between a glume and a palea (*Grasses*) 12

4. Sedges with leaf-blades unarmed, sometimes absent; nuts minute and not 6-ribbed 5

Sedges with leaf-blades spiny on edges and mid-rib beneath; nuts large, black, hard, 6-ribbed *215. Scirpodendron.*

5. Intermediate glumes of a spikelet containing hermaphrodite flowers usually numerous, always more than the 1-2 lowest empty glumes 6

Intermediate glumes of a spikelet containing hermaphrodite flowers always few, never more numerous than the 2 or more lowest empty glumes . . . *214. Cladium.*

6. Flowering glumes 2-ranked 7

Flowering glumes arranged spirally 10

7. Spikelets arranged in an open inflorescence . . . 8

Spikelets densely clustered in a close head; rachilla of the spikelet deciduous . . . . *207. Kyllinga.*

8. Rachilla of the spikelet persistent 9

Rachilla of the spikelet deciduous . . *210. Mariscus.*

9. Fruit flattened laterally . . . . *208. Pycreus.*

Fruit 3-cornered or flattened dorsally . . *209. Cyperus.*

10. (6) Base of style constricted or jointed above the fruit 11

Base of style continued into the fruit . . *213. Scirpus.*

11. Stem leafy below . . . . *212. Fimbristylis.*

Stem leafless . . . . . *211. Eleocharis.*

12. (3) Stamens 6 13

Stamens not more than 3 14

13. Glumes firm and chartaceous . . . *221. Oryza.*

Glumes thin and membranous . . . *222. Leersia.*

14. (12) Spikelets deciduous from their pedicels or falling with them; perfect spikelets with 2 heteromorphous florets, the upper hermaphrodite, the lower male or neuter . 15

Spikelets continuous with their pedicels and breaking off so as to leave the persistent or subpersistent glumes on the pedicel, or if falling entire not composed of 2 heteromorphous florets 23

15. Rachis not continued beyond terminal spikelet . . 16

Rachis continued beyond the terminal spikelet

220. Chamæraphis.

16. Spikelets in continuous spikes, racemes or panicles; outer glumes not firmer than flowering glumes, the lowest smallest sometimes very small or obsolete . . . 17
Spikelets in pairs, one sessile, the other pedicelled, or the terminal 3-nate or solitary; outer glumes firmer than the flowering glumes, the lowest longer than the florets 21
17. Spikelets not subtended by a whorl of bristles . . . 18
Spikelets subtended by a whorl of bristles . 219. *Setaria.*
18. Spikelets 2-flowered, the upper hermaphrodite, the lower male or barren, separating from their pedicels . . 19
Spikelets 1-flowered, deciduous with the pedicels 223. *Zoysia.*
19. Lowest glume obsolete, *i.e.*, only 3 glumes present . . 20
Lowest glume present, *i.e.*, glumes 4 . . 218. *Panicum.*
20. Spikelets not thickened at the base . . 216. *Paspalum.*
Spikelets thickened at base . . . 217. *Eriochloa.*
21. (16) Spikelets similar 22
Spikelets dissimilar . . . . 226. *Andropogon.*
22. Stamens 3 . . . . . 225. *Saccharum.*
Stamens 2 . . . . . 224. *Imperata.*
23. (14) Spikelets panicled or if spicate not secund . . 24
Spikelets 2-seriate and secund 27
24. Spikelets 2-more-flowered 25
Spikelets 1-flowered . . . . 227. *Sporobolus.*
25. Spikelets without silky hairs 26
Spikelets with glabrous glumes, but penicillate with long silky hairs on the rachilla . . . 230. *Phragmites.*
26. Outer glume shorter than the lowest flowering glume; grain minute . . . . . 231. *Eragrostis.*
Outer glume longer than the lowest flowering glume; grain broad . . . . . 232. *Myriostachya.*
27. (23) Spikelets digitate or whorled 28
Spikelets on the long, slender, spiciform branches of an elongated simple panicle . . . . 233. *Diplachne.*
28. Spikelets 1-flowered . . . . . 228. *Chloris.*
Spikelets more than 1-flowered . . . 229. *Eleusine.*
29. (2) Aquatic plants, floating or submerged . . . 30
Land plants or, if growing in water, not submerged under normal conditions; leaves and stems not floating . 44
30. Leaves and stems floating, with roots from base or nodes suspended in the water 31
Leaves and stems submerged; roots attached to soil . 34

31. Stems more or less elongated, with leaves and roots at nodes separated by distinct internodes 32
Stems very short, with a rosette of clustered leaves above and a tuft of roots below . . 204. *Pistia.*
32. Leaves alternate 33
Leaves whorled; small plants with articulate stems and almost transparent leaves . . . 61. *Aldrovanda.*
33. Flowers small, white . . . . 116. *Limnanthemum.*
Flowers rather large, purplish . . . 123. *Ipomœa.*
34. (30) Plants submerged only at high-tides . . . 35
Plants in still water, always submerged . . . 37
35. Shrubs or herbs with leafless, fleshy, jointed stems; flowers not in spathes 36
Herbs with buried rootstock and tufted linear-lanceolate leaves; flowers on a spadix enclosed in a tubular spathe septate within . . . . 203. *Cryptocoryne.*
36. Flowers in sessile cone-like spikes . 149. *Arthrocnemum.*
Flowers sunk in cavities in joints of stem . 148. *Salicornia.*
37. (34) Flowers at or above the surface of the water . . 38
Flowers as well as leaves submerged 42
38. Flowers white, solitary on a scape 39
Flowers yellow, in racemes rising above the surface of the water . . . . . 131. *Utricularia.*
39. Stemless plants; leaves all radical 40
Stem leafy throughout 41
40. Perianth single; fruit on a slender spiral scape, not winged; male spathes disarticulating . 177. *Vallisneria.*
Perianth double; fruit on a stoutish scape, winged 178. *Ottelia.*
41. (39) Leaves whorled . . . . . 175. *Hydrilla.*
Leaves alternate . . . . 176. *Lagarosiphon.*
42. (37) Stamens 1-2; leaves linear 43
Stamens numerous; leaves cut into many filiform, toothed lobes . . . . . 174. *Ceratophyllum.*
43. Leaves entire; stamens 2 . . . . 205. *Ruppia.*
Leaves toothed; stamen 1 . . . . 206. *Naias.*
44. (29) Plants growing epiphytically or parasitically on the stems or branches of other species 45
Plants rooted in the ground 59
45. Leafless twining parasites with long slender stems . . 46
Leafy not twining partial parasites or epiphytes . . 47
46. Stems and flowers green; stamens 9 . . 153. *Cassytha.*
Stems yellowish, flowers white; stamens 5 . 124. *Cuscuta.*

47. (45) Leaves opposite; flowers regular or nearly so . . . *48*
Leaves alternate or leaf solitary; flowers irregular (*Orchids*) *51*
48. Juices milky; non-parasitic *49*
Juices watery; parasitic *50*
49. Corolla medium, rotate; flowers in stalked umbels *114. Hoya.*
Corolla, small, urceolate; flowers in axillary fascicles *113. Dischidia.*
50. (48) Leaves usually broad, penninerved; flowers hermaphrodite . . . . . *154. Loranthus.*
Leaves rather narrow, 3-nerved from the base; flowers 1-sexual . . . . . *155. Viscum.*
51. (47) Leaf solitary at apex of a rounded pseudobulb . *52*
Leaves more than one, on a usually elongated stem . *53*
52. Flowers in umbels; lateral sepals under the lip, longer than the dorsal . . . . . *181. Cirrhopetalum.*
Flowers solitary; sepals all equal, spreading . *182. Trias.*
53. (51) Leaves terete *54*
Leaves flattened or compressed *55*
54. Lip not spurred . . . . . *183. Luisia.*
Lip spurred . . . . . *185. Sarcanthus.*
55. (53) Leaves flattened with an upper and a lower surface or, if laterally compressed and equitant, with sheath about as long as blade and flowers axillary *56*
Leaves compressed, equitant, sheath shorter than blade; and flowers many, minute, in a narrow raceme *179. Oberonia.*
56. Stems not tufted, roots few, large, issuing at intervals from side of stem, leaves flat or channeled, coriaceous; lip spurred *57*
Stems tufted; roots many, clustered at base; leaves flat, thin; or short, equitant, and fleshy; lip with only a short mentum . . . . . *180. Dendrobium.*
57. Spur of the lip partially occluded *58*
Spur of the lip with neither occluding calli nor a septum within . . . . . *184. Saccolabium.*
58. Spur occluded by calli but with no septum *186. Cleisostoma.*
Spur partially occluded by calli and with besides a vertical antero-perterior septum dividing it into two lateral chambers . . . . . *185. Sarcanthus.*
59. (44) Plants climbing by means of tendrils . . . *60*
Plants without tendrils *71*
60. Tendrils forming part of a leaf *61*
Tendrils not forming part of a leaf *63*

61. Leaves compound; tendrils a continuation of main rachis 62
Leaves simple, the tendrils the spirally curled tips of the leaf-blades . . . . . 194. *Flagellaria.*

62. Leaves once divided, leaflets 2; fruits in clusters of feathery achenes . . . . . 1. *Naravelia*
Leaves twice compound, leaflets several; fruits of very large pods . . . . . 59. *Entada.*

63. (60) Leaves simple or only once divided; fruit indehiscent or opening by a stopple 64
Leaves twice 3-nately compound; fruit a bladder-like 3-celled capsule . . . . . 31. *Cardiospermum.*

64. Flowers with no corona between petals and the stamens . 65
Flowers with a distinct corona interposed between petals and stamens . . . . . 73. *Passiflora.*

65. Stamens and pistil in different flowers 66
Stamens and pistils in the same flower; leaves simple or once divided . . . . . 29. *Vitis.*

66. Tendrils branched 67
Tendrils simple 68

67. Petals with margins entire . . . . . 75. *Luffa.*
Petals with margins fimbriately divided . 74. *Trichosanthes.*

68. (66) Corolla divided nearly to base into 5 equal petals . 69
Corolla campanulate with lobes only divided about halfway down . . . . . 78. *Cephalandra.*

69. Anther-cells folded sigmoidly 70
Anther-cells straight or, if curved, not sigmoid 79. *Zehneria.*

70. Staminate flowers racemed . . . 76. *Momordica.*
Staminate flowers clustered or solitary . . 77. *Cucumis.*

71. (59) Leaves dotted with embedded glands . . . 72
Leaves not dotted with embedded glands . . . 81

72. Leaves alternate; trees or shrubs 73
Leaves opposite, simple 77

73. Leaves simple 74
Leaves compound 75

74. Stem unarmed; fruit a narrow, curved capsule 99. *Ægiceras.*
Stem spinous, scandent; fruit globose, umbonate, indehiscent . . . . . 22. *Paramignya.*

75. (73) Leaflets alternate; stamens 10 or fewer . . . 76
Leaflets an opposite pair with one terminal; stamens 30 or more . . . . . 23. *Ægle.*

76. Leaflets 3-5 . . . . . 20. *Glycosmis.*
Leaflets 9-15 . . . . . 21. *Micromelum.*

77. (72) Herbs; corolla gamopetalous 78
Trees; petals free . . . . . 67. *Eugenia.*
78. Fruit of 4 small nutlets with a single seed in each . . 79
Fruit a 2-celled many-seeded capsule . *127. Limnophila.*
79. Calyx with upper tooth not exceeding the others; stamens ascending under the upper lip 80
Calyx with upper tooth decurrent, much exceeding the others; stamens declinate . . . *142. Ocimum.*
80. Upper lip of corolla flat . . . *143. Anisomeles.*
Upper lip of corolla vaulted, densely villous on back *144. Leucas.*
81. (71) Leaves very minute and scale-like 82
Leaves with a quite distinct leaf-blade 83
82. Tall trees; branches, green, cylindric, jointed; nodes with sheaths of connate subulate scales . . *173. Casuarina.*
Small trees with many close-set but not connate, alternate imbricating scale-like leaves . . . *10. Tamarix.*
83. (81) Leaves compound 84
Leaves simple 125
84. Leaves alternate 85
Leaves opposite 124
85. Leaves digitate 86
Leaves pinnate 92
86. Stems not climbing or twining 87
Stems twining; leaf axils bulbiferous . . *190. Dioscorea.*
87. Leaflets 3 only 88
Leaflets more than 3 91
88. Shrubs or herbs 89
Trees . . . . . 6. *Cratæva.*
89. Stems erect 90
Stems prostrate . . . . . *19. Oxalis.*
90. Leaflets without resinous glands below . . *36. Crotalaria.*
Leaflets with resinous glands below . . *48. Flemingia.*
91. (87) Flowers yellow . . . . . *4. Cleome.*
Flowers purplish to white . . . *5. Gynandropsis.*
92. (85) Leaflets 3 only 93
Leaflets more than 3 102
93. Stems erect 94
Stems prostrate or climbing 97
94. Stems woody 95
Stems herbaceous; hairs fixed by their centres *37. Cyamopsis.*
95. Stem unarmed 96
Stem armed with conical prickles . . . *43. Erythrina.*

96. Fruit fleshy, 1-2-lobed; leaflets toothed . . *32. Allophylus.*
Fruit a lomentum, breaking up into indehiscent joints; leaflets entire . . . . . *39. Desmodium.*

97. (93) Stems herbaceous; pods without stinging hairs *98*
Stems woody; pods with stinging hairs . . *42. Mucuna.*

98. Leaves not glandular beneath *99*
Leaves with superficial resinous glands among the hairs beneath . . . . . *47. Atylosia.*

99. Stamens monadelphous *100*
Stamens diadelphous *101*

100. Flowers small; pods thin, narrow; alternate stamens abortive . . . . . *41. Teramnus.*
Flowers large; pods thick, wide; all the stamens with perfect anthers . . . . . *44. Canavalia.*

101. (99) Keel spirally twisted . . . . *45. Phaseolus.*
Keel obtuse, not spirally twisted . . . *46. Vigna.*

102. (92) Leaves unequally pinnate *103*
Leaves even-pinnate *114*

103. Flowers on spadices covered by spathes; woody stems with the vascular bundles isolated and scattered (*Palms*) . *104*
Flowers not on spadices; woody stems with vascular bundles in concentric rings *109*

104. Stems erect, or stem very short and leaves tufted . . *105*
Stems scandent with the aid of retrorse hooks *108*

105. Leaflets with reduplicate sides *106*
Leaflets induplicate; stems long, slender . *197. Phœnix.*

106. Stems elongated, with a terminal tuft of leaves . . *107*
Stems very short, with a tuft of very large leaves close to the ground . . . . . *195. Nipa.*

107. Stems straight, slender; fruits numerous, never more than 2 in. long . . . . . *196. Areca.*
Stems rather crooked, stout; fruits fewer, always more than 8 in. long . . . . . *200. Cocos.*

108. (104) Spathe tubular, persistent . . . *198. Calamus.*
Spathe cymbiform, deciduous . . *199. Dæmonorops.*

109. (103) Leaflets opposite *110*
Leaflets alternate . . . . . *49. Dalbergia.*

110. Leaflets once pinnate *111*
Leaflets more than once pinnate . . . . *30. Leea.*

111. Erect trees *112*
Climbing shrubs . . . . . *51. Derris.*

112. Roots without root-suckers; fruit indehiscent . . . *113*
Roots with vertical blind root-suckers; fruit a subglobose, 2-3-celled capsule . . . . . *24. Amoora.*

113. Fruit a small compressed drupe with a hard stone; leaves few, at ends of branches . . . . . *35. Odina.*
Fruit a coriaceous, indehiscent 1-seeded pod; leaves scattered, many . . . . . *50. Pongamia.*

114. (10) Leaves once pinnate; unarmed species . . . *115*
Leaves more than once pinnate; species armed with spines or thorns or prickles *121*

115. Stems erect *116*
Stems twining . . . . . *40. Abrus.*

116. Fruit a pod, dehiscent or indehiscent *117*
Fruit a large, globose, 4-valved capsule . . *25. Carapa.*

117. Petals 5 . . . . . *118*
Petals fewer than 5 . . . . . *120*

118. Stamens free; petals equal, the upper inmost . . . *119*
Stamens united nine below in a sheath, one upper free; petals unequal, irregular, the upper the outmost *38. Sesbania.*

119. Anthers large, often unequal, only seven perfect, opening by apical pores . . . . . *55. Cassia.*
Anthers small, opening by lateral slits . . *56. Cynometra.*

120. (117) Petals 3; stamens 3, filaments short, united; pod pulpy indehiscent . . . . . *57. Tamarindus.*
Petal solitary; stamens 3, filaments long, free; pod dry, dehiscent . . . . . *58. Intsia.*

121. (114) Flowers medium, in racemes or panicles; petals free; stamens 10 . . . . . *122*
Flowers minute, in globose heads; petals united below; stamens more than 10 *60. Acacia.*

122. Pod flattened or swollen, but not beaded opposite the seeds; calyx with a larger cymbiform lowest lobe . . . *123*
Pod turgid, beaded opposite the seeds; calyx lobes all subequal . . . . . *54. Parkinsonia.*

123. Pod broadly winged down upper suture *53. Mezoneuron.*
Pod not winged . . . . . *52. Cæsalpinia.*

124. (84) Leaves digitate . . . . . *139. Vitex.*
Leaves pinnate . . . . . *132. Dolichandrone.*

125. (83) Flowers minute, in heads surrounded by a whorl of bracts *126*
Flowers rarely in heads, and if so not surrounded by a whorl of bracts *136*

126. Leaves alternate *127*
Leaves opposite *135*
127. Plants armed with sharp spines *128*
Plants unarmed *129*
128. Spines forked, scattered along stem; margins of leaves not spiny . . . . . *94. Xanthium.*
Spines simple, on margins of the leaves . *96. Cnicus.*
129. (127) Juice not milky *130*
Juice milky . . . . . *97. Launea.*
130. Herbs *131*
Shrubs or under-shrubs . . . . *92. Pluchea.*
131. Florets yellow . . . . . *132.*
Florets purple . . . . . *87. Vernonia.*
132. Stems not winged . . . . . *133.*
Stems winged . . . . . *93. Sphaeranthus.*
133. Anther-cells without tails *134*
Anther-cells tailed . . . . . *91. Blumea.*
134. Outer florets of head (ray) differing from central florets; stem erect . . . . . *90. Conyza.*
Outer florets like central; stem prostrate . *89. Grangea.*
135. (126) Florets yellow . . . . . *95. Wedelia.*
Florets purple . . . . . *88. Ageratum.*
136. (125) Leaves alternate or radical only *137*
Leaves opposite *193*
137. Plants with milky juice; trees *138*
Plants with watery juice; if bitter or resinous, not milky . *142*
138. Flowers visible *139*
Flowers minute, hidden within a hollow, closed, fleshy receptacle . . . . . *172. Ficus.*
139. Flowers small or minute, incomplete; perianth green . *140*
Flowers large; corolla white . . . . *102. Cerbera.*
140. Leaves smooth; juice acrid; fruit a 3-celled capsule . *141*
Leaves scabrid, juice bland; fruit covered by the persistent calyx, membranous, 1-seeded . . . *173. Streblus.*
141. Racemes terminal; leaves toothed . . . *168. Sapium.*
Racemes axillary; leaves entire . . *169. Excœcaria.*
142. (137) Leaves with a convolute leaf-sheath . . . *143*
Leaves with no distinct leaf-sheath *151*
143. Stems erect, woody; shrubs or small trees . . . *144*
Stems herbaceous, or stem none; leaves radical . . *145*
144. Leaves with orbicular blades distinct from leaf-sheaths; not prickly . . . . . *98. Ægialitis.*

Leaves with linear blades passing into the leaf-sheaths; armed with prickles along the margins and the midrib beneath . . . . . *201. Pandanus.*

145. (143) Leaf-blades flattened *146*
Leaf-blades linear, spongy or fistular, semi-cylindric or triquetrous; all radical *150*

146. Stems above ground herbaceous, decumbent, rooting . *147*
Stems underground or none, or if above ground erect . *148*

147. Cymes included in a large bract . . *192. Commelina.*
Cymes naked, paniculate . . . . *193. Aneilema.*

148. (146) Leaves on an erect pseudo-stem formed of clasping leaf-sheaths *149*
Leaves radical; flowers large, umbellate . *189. Crinum.*

149. Flowers in a panicle at the apex of the leafy pseudo-stem *188. Alpinia.*
Flowers in a spike rising direct from root-stock, separate from the leafy pseudo-stem . . . *187. Zingiber.*

150. (145) Flowers distinct, white, racemose; scape slender; field-weeds . . . . . *191. Asphodelus.*
Flowers minute, close-set on a cylindric spike; large aquatic plants (*Bulrushes*) growing on edges of ponds and streams . . . . . *202. Typha.*

151. (142) Petals or perianth-segments united in a gamopetalous corolla *152*
Petals never united, often not present *161*

152. Corolla regular, its base surrounded by a calyx . . *153*
Corolla (perianth) irregular; calyx absent *152. Aristolochia.*

153. Erect trees *154*
Herbs or climbing under-shrubs or shrubs . . . *155*

154. Stamens 5 or 6 . . . . . *118. Cordia.*
Stamens 16 or more . . . . . *106. Diospyros.*

155. (153) Stems prostrate or, if twining, unarmed . . . *156*
Stems erect or, if climbing, prickly *159*

156. Flowers large, stalked, pink to purple; stems twining or if prostrate the leaves not lying flat on the ground and not crispate *157*
Flowers small, sessile, white; stems and crispate leaves both close to ground . . . . *119. Coldenia.*

157. Sepals coriaceous but not so enlarged in fruit as to hide the capsule *158*
Sepals fleshy and mucilaginous in fruit, quite concealing the capsule . . . . . *121. Stictocardia*

158. Pollen spinulose . . . . . *123. Ipomœa.*
Pollen not spinulose . . . . . *122. Merremia.*
159. (155) Inflorescence of lax racemes, cymes, or umbels . *160*
Inflorescence of dense spikes . . *120. Heliotropium.*
160. Fruit a capsule . . . . . *117. Hydrolea.*
Fruit a berry . . . . . *125. Solanum.*
161. (151) Plants prickly or spiny or thorny *162*
Plants unarmed *165*
162. Sarmentose or semi-erect; armed with thorns or prickles *163*
Erect; armed with rigid spines . . . *8. Flacourtia.*
163. Fruit sessile above the calyx; stamens not more numerous than petals *164*
Fruit stipitate on a carpophore; stamens more numerous than petals; thorns of modified stipules . *7. Capparis.*
164. Leaves glabrous; plant armed with few prickles . *26. Olax.*
Leaves more or less hairy; plant armed with numerous stipular thorns . . . . . *28. Zizyphus.*
165. (161) Stems sarmentose or twining *166*
Stems erect *170*
166. Flowers small or very small, greenish *167*
Flowers large, showy, yellow . . . *13. Hibiscus.*
167. Stems woody, rather stout; flowers all 1-sexual . . *168*
Stems herbaceous *169*
168. Stamens numerous; fruit a capsule . . . *167. Mallotus.*
Stamens 5; fruit a small drupe . . . *157. Bridelia.*
169. (167) Flowers 1-sexual; stamens 6; carpels 3, free; seeds curved. . . . . *2. Tinospora.*
Flowers 2-sexual; stamens 5; ovary 1-celled . *151. Basella.*
170. (165) Trees or large woody shrubs *171*
Herbs or small under-shrubs *182*
171. Leaves with margins quite entire *172*
Leaves with margins toothed *180*
172. Leaves subcordate, palminerved at the base . . . *173*
Leaves oblong to lanceolate, penninerved . . . *174*
173. Flowers large, showy, yellow . . . *14. Thespesia.*
Flowers medium, rose-coloured . . . *16. Kleinhovia.*
174 (172) Fruit not crowned by the calyx *175*
Fruit crowned by the remains of the calyx . *66. Lumnitzera.*
175. Leaves with silvery scales beneath; ripe carpels free . *176*
Leaves glabrous or hairy but not scaly beneath; ripe carpels united *177*
176. Petals 5 . . . . . *17. Brownlowia.*
Petals 0 . . . . . *15. Heritiera.*

177. (175) Leaves glabrous beneath *178*
Leaves tomentose beneath . . . *162. Antidesma.*
178. Petals 0 . . . . . *179*
Petals 5, each with a basal scale . . . *33. Aphania.*
179. Stamens 3, united in a central column . . *160. Breynia.*
Stamens 6 or more, free . . . *161. Cyclostemon.*
180. (171) Flowers small, 1-sexual; fruit not crowned by the remains of the calyx *181*
Flowers large, 2-sexual; fruit large, indehiscent with the calyx-lobes persistent on its apex . *69. Barringtonia.*
181. Stamens 10-12; sepals clothed with flat scales; fruit a 3-celled capsule . . . . . *163. Croton.*
Stamens 3-5; sepals hairy but without scales; fruit minute, 1-seeded . . . . . *170. Trema.*
182. (170) Petals 0 or, if present, similar in size and shape . *183*
Petals large, dissimilar and very irregular, the uppermost outmost . . . . . *36. Crotalaria.*
183. Stamens united *184*
Stamens free *188*
184. Flowers conspicuous; petals yellow; stamens many, in a tube round the style; flowers 2-sexual . . . *185*
Flowers very small, green, 1-sexual; petals 0 . . . *186*
185. Styles as many as the carpels . . . *11. Abutilon.*
Styles twice as many as the carpels . . *12. Malachra.*
186. (184) Stamens 3 only, united in a central column . . *187*
Stamens 5-15, united in whorls . . . *164. Chrozophora.*
187. Sepals of male flowers with white margins . *158. Agyneia.*
Sepals green . . . . . *159. Phyllanthus.*
188. (183) Flowers yellow *189*
Flowers white or green, very small *190*
189. Stamens 10 or more; flowers small . . *18. Corchorus.*
Stamens 5; flowers large . . . . *72. Turnera.*
190. (188) Leaves entire or toothed, not lobed; petals 0 . *191*
Leaves deeply pinnatifidly divided; sepals 4; petals 4; stamens 6 . . . . . *3. Senebiera.*
191. Leaves broad, membranous *192*
Leaves narrow, fleshy; sepals 5; stamens 5 . *150. Suæda.*
192. Stamens 5 or fewer; leaves not toothed; sepals scarious; fruit 1-celled . . . . . *145. Amarantus.*
Stamens 8 or more; leaves toothed; sepals herbaceous, united; fruit 3-celled . . . . *165. Acalypha.*
193. (136) Juices milky *194*
Juices not milky *204*

194. Stipules wanting ; fruit 2-follicular *195*
Stipules present, minute ; fruit 3-celled . . *156. Euphorbia.*
195. Stems twining *196*
Stems erect . . . . . *107. Calotropis.*
196. Seeds with a pencil of hairs (coma) *197*
Seeds without hairs . . . . *110. Sarcolobus.*
197. Corolla with a corona in the throat *198*
Corolla throat naked . . . . . *103. Parsonsia.*
198. Filaments of stamens united *199*
Filaments free *203*
199. Corona single, staminal only *200*
Corona double, coro'line and staminal . . *106. Oxystelma.*
200. Corolla rotate *201*
Corolla funnel-shaped . . . . . *109. Dæmia*
201. Pollen masses erect, or at least with erect pedicels . . *202*
Pollen-masses wholly pendulous . . *108. Pentatropis.*
202. Flowers green, fairly large ; pollen-masses quite erect ; follicles stout . . . . . *111. Dregea.*
Flowers white, minute ; pollen-masses with only the pedicels erect ; follicles slender . . . *112. Tylophora.*
203. (198) Scales of corona short, thick . *104. Hemidesmus.*
Scales of the corona filiform . . . *105. Finlaysonia.*
204. (193) Leaves with stipules or interpetiolar nodal appendages or stipular lines *205*
Leaves without stipules or interpetiolar lines . . . *215*
205. Trees or large woody shrubs *206*
Herbs with prostrate stems and branches . . . *214*
206. Flowers 2-sexual ; corolla always present . . . *207*
Flowers diœcious ; petals 0 ; leaves palminerved *166. Trewia.*
207. Petals distinct ; embryo germinating before fruit falls (*Mangroves*) *208*
Petals united in a regular tubular corolla . . . *211*
208. Petals more than 4 ; stamens more than 8 . . . *209*
Petals 4, entire ; stamens 8 . . . . *62. Rhizophora.*
209. Calyx-segments and petals 5-6 . . . . . *210*
Calyx-segments and petals 8-14 ; stamens 16-28 *65. Bruguiera.*
210. Petals emarginate ; stamens 10-12 ; ovary 3-celled *63. Ceriops.*
Petals lacerate ; stamens over 12 ; ovary 1-celled *64. Kandelia.*
211. (207) Branches unarmed *212*
Branches armed with axillary spines . . *84. Vangueria.*
212. Flowers quite free *213*
Flowers with the calyx-tubes agglutinated to form large fleshy heads . . . . . *86. Morinda.*

213. Flowers small, in axillary spikes . . . *83. Petunga.*
Flowers long-tubed, in terminal cymes . . . *85. Ixora.*
214. (205) Flowers white; corolla tubular; stamens 4-5; stipules connate; leaves herbaceous . . . *82. Oldenlandia.*
Flowers yellow; petals free; stamens 8 or more; stipules represented by scarious nodal appendages; leaves and stems fleshy, succulent . . . . . *9. Portulaca.*
215. (204) Roots with blind vertical root-suckers . . . *216*
Roots without blind root-suckers *217*
216. Flowers large; stamens very many, rising from calyx; petals free or absent . . . . *71. Sonneratia.*
Flowers small, yellow; stamens 4, adnate to corolla; petals connate . . . . . *141. Avicennia.*
217. (215) Petals united in an irregular corolla . . . *218*
Petals absent or, if present, free *229*
218. Stamens 4 perfect *219*
Stamens 1 only perfect, 3 barren; very small herbs in waste-places and fields . . . . *115. Hoppea.*
219. Fruit a 2-celled capsule with more than one seed in each of the cells *220*
Fruit with 4 or more 1-seeded cells, rarely a capsule . *226*
220. Stamens didynamous, one pair longer than the other . *221*
Stamens nearly equal in length; flowers very small, white; seeds many . . . . . *130. Scoparia.*
221. Seeds hard, on rigid curved stalks (retinacula) . . . *222*
Seeds without retinacula *224*
222. Seeds more than 2 in each cell; corolla with an upper lip or posterior lobes *223*
Seeds only 2 in each cell; corolla with a 3-lobed lower lip but no upper . . . . . *135. Acanthus.*
223. Corolla distinctly 2-lipped . . . . *133. Hygrophila.*
Corolla with 5 nearly equal lobes . . *134. Hemigraphis.*
224. (221) Corolla-tube distinct, throat not saccate in front . *225*
Corolla-tube short, throat saccate in front . *126. Angelonia.*
225. Calyx-segments equal . . . . . *129. Vandellia.*
Calyx-segments unequal . . . . . *128. Herpestis.*
226. (219) Flowers in capitate or ovoid spikes . . . *227*
Flowers in open cymes *228*
227. Fruit leathery, indehiscent . . . . *136. Lantana.*
Fruit dry, partially dehiscent . . . *137. Lippia.*
228. (226) Flowers very small, greenish-white . *138. Premna.*
Flowers large, white . . . . *140. Clerodendron.*

229. (217) Unarmed species 230
Armed shrubs or under-shrubs; spines axillary *101. Azima.*
230. Trees or large shrubs; petals present 231
Herbs; petals wanting 233
231. Stamens 5 or fewer; fruit not tipped by the calyx . . 232
Stamens numerous; fruit large, crowned by the persistent calyx-lobes . . . . . *68. Psidium.*
232. Flowers 3-6 from small tubercles; fruit a small hard berry; rambling shrubs . . . . . *27. Salacia.*
Flowers many, in lax panicles; fruit a compressed fleshy edible drupe; considerable trees . . *34. Bouea.*
233. (230) Stem prostrate, rooting at the nodes . . . 234
Stems erect . . . . . *70. Ammannia.*
234. Sepals connate in a short calyx; stamens free, inserted round mouth of calyx-tube 235
Sepals free; stamens connate in a cup below ovary . . 236
235. Capsule 3-5-celled . . . . . *80. Sesuvium.*
Capsule 1-2-celled . . . . *81. Trianthema.*
236. (234) Sepals hard, the outer ones 3-ribbed; stamens 5; anthers 2-celled . . . . *146. Psilotrichum.*
Sepals herbaceous, flexible, not ribbed; stamens 2 3; anthers 1-celled . . . . *147. Alternanthera.*
237. (1) Fronds very large as compared with the stem . . 238
Fronds small or minute 247
238. Fronds circinate; sporangia on under-surface . . . 239
Fronds erect; sporangia spicate in crested clusters on a separate segment . . . *243. Helminthostachys.*
239. Sori confined to margins or veins of under-side of fronds . 240
Sori spread over whole under-surface of fertile fronds or parts of fronds . . . . *242. Acrostichum.*
240. Epiphytic or terrestrial ferns 241
Aquatic ferns, growing in still waters . *236. Ceratopteris*
241. Sori remote from margins of fronds 242
Sori marginal or nearly so 244
242. Sori covered by an indusium 243
Sori without an indusium . . . *239. Polypodium.*
243. Indusium reniform . . . . *238. Nephrodium.*
Indusium oblong or linear . . . . *237. Asplenium.*
244. (241) Sori protected by an indusium 245
Sori without an indusium 246
245. Sporangia attached to under-side of indusium, which consists of the intucked margin of the frond *234. Adiantum.*

Sporangia not arising from the indusium, which is distinct from the margin of the frond . . . . *235. Pteris.*

246. (244) Fronds grass-like, all similar . . . *240. Vittaria.*
Fronds dimorphic . . . . . *241. Drymoglossum.*

247. (237) Leaves many, crowded; sporangia orbicular, compressed, 1-celled, 1-valved . . . *244. Lycopodium.*
Leaves minute, distant, rudimentary; sporangia turbinate, 3-celled, 3-valved . . . . . *245. Psilotum.*

VI.—SYSTEMATIC CENSUS OF SPECIES.

In the subjoined list of plants hitherto reported from the Sundribuns, the order followed is that of the *Flora of British India*,* which is referred to throughout; there, descriptions of the majority of the species are to be found. References are also given to Roxburgh's *Flora Indica* † for such of the species as are there described. Moreover, Watt's *Dictionary of the Economic Products of India* ‡ is cited under the species referred to in that work. These references, it is hoped, may lead to the identification of any species that it is found impossible to run down with the aid of the *Guide to the Genera* given in the preceding Chapter, and with the help of the keys to species that are given in the *Census* itself.

In the case of the Cryptogams the references are to Clarke's edition of the *Flora Indica* and to the *Synopsis Filicum*§ of Hooker and Baker. Planted or cultivated species are marked (*).

THALAMIFLORÆ.

I.—RANUNCULACEÆ.

1. Naravelia DC.

1. **Naravelia zeylanica** DC.; F. B. I. i. 7. *Atragene zeylanica* F. I. ii. 670. E. D. N 8.

Generally distributed, but not common. Northern Forests, *Calcutta Garden Collectors*! Coast at Tiger Point, *Heinig*!

Vernac. *Murcha.*

Scandent on bushes; stems sometimes twisted into ropes; root tuberous.

Distrib.—India; Indo-China; Malaya.

The common Bengali name is Chhagal-bati, which is also used to designate *Dæmia extensa.*

* Cited as F. B. I. with volume and page.
† Cited as F. I. with volume and page.
‡ Cited as E. D. with letter and reference number.
§ Cited as Synops. Fil. with page.

II.—MENISPERMACEÆ.

2. Tinospora Miers.

2. **Tinospora tomentosa** Miers; F. B. I. i. 96. *Menispermum tomentosum* F. I. iii. 813.
Jatta, ruins of pagoda, *Prain*!
Vernac. *Padma-guláncha.*

Scandent; possesses the tonic properties of the common Guláncha (*T. cordifolia*).

DISTRIB.—Lower Bengal; Lower Burma: always rare.

III.—CRUCIFERÆ.

3. Senebiera Poir.

3. **Senebiera pinnatifida** DC.
Banks of Mátla river, in sandy places, *Calcutta Garden Collectors*!

A diffuse procumbent annual; properties insignificant.

DISTRIB.—Temp. S. America. Apparently a recently introduced plant in India; reported from Upper Sind (*Cooke*, *Woodrow*) and from Banda (*Mrs. Bell*); earliest Sundribuns record, 1898.

IV.—CAPPARIDEÆ.

4. Cleome Linn.

4. **Cleome viscosa** Linn.; F. I. iii. 128; F. B. I. i. 170. E. D. C 1367.
Jatta, among ruins of pagoda, *Prain*!
Vernac. *Húrhúria.*

An erect annual; seeds yield an oil which, with the juice of the plant, is used for ear complaints; seeds also used as food; flowers yellow.

DISTRIB.—Cosmopolitan in tropical and subtropical regions.

5. Gynandropsis DC

5. **Gynandropsis pentaphylla** DC.; F. B. I. i. 171. *Cleome pentaphylla* F. I. iii. 126. E. D. G 753.
Canning Town, *Calcutta Garden Collectors*! *Prain!*
Vernac. *Sada Húrhúria.*

An erect annual, cult. or an escape; properties much as in *Cleome viscosa*; flowers pale-purple to white.

DISTRIB.—Cosmopolitan in the tropics.

6. Cratæva Linn.

6 **Catæva religiosa** Forst.; F. B. I. 172.—*Capparis trifoliata* F. I. ii. 571. E. D. C 2039.

Northern forests and clearings, *Heinig*!
Vernac. *Barún, Tikto-shak.*

An unarmed tree; stands long leafless; properties tonic and rubefacient; flowers purplish-yellow.

DISTRIB.—Supposed wild in Malabar; elsewhere planted.

The presence of this in the Sundribun forests is doubtless one of the vestiges of former occupation on mounds or platforms of higher ground, *e.g.*, on the left bank of the Mandabari river.

7. Capparis Linn.

7. **Capparis sepiaria** Linn.; F. I. ii. 568; F. B. I. i. 177. E. D. C. 427.
Coast, *Heinig*! Jatta, *Prain*!
Vernac. *Kanta Gurkamai.*

A stout thorny climbing shrub; said to possess antiperiodic properties.

DISTRIB.—India; Indo-China; Malaya; Philippines.

This species is very characteristic of the sea-fence immediately behind the beaches, on the Burmese and Andaman coasts.

V.—BIXINEÆ.

8. Flacourtia Comm.

8. **Flacourtia sepiaria** Roxb.; F. I. iii. 835; F. B. I. i. 194. E. D. F 624.
Northern forests and clearings; Cheila Bogi river, *Heinig & Gammie*! Jatta, *Prain*!

A thorny bush; properties unimportant.

DISTRIB.—India; Indo-China; Malaya.

VI.—PORTULACACEÆ.

9. Portulaca Linn.

9. **Portulaca oleracea** Linn.; F. I. ii. 463; F. B. I. i. 246. E. D. P 1179.
Northern clearings, very rare, *Prain*!
Vernac. *Laniya.*

A prostrate succulent annual; a fair vegetable.

DISTRIB.—Cosmopolitan in the tropics.

VII.—TAMARISCINEÆ.

10. Tamarix Linn.

10. **Tamarix gallica** Linn. VAR. **indica** Dyer; F. B. I. i. 248. *T. indica* F. I. ii. 100. E. D. T 70.

Everywhere on river-banks from the northern forests to sea-face; especially plentiful in recent clearings.

Vernac. *Jhao*; *Nuna gách.*

A shrub or small tree, up to 20 feet high; cut for firewood: the galls and bruised twigs provide an indifferent tan.

DISTRIB.—Shores of W. and S. Europe; N. and Trop. Africa; S.-E. Asia.

VIII.—MALVACEÆ.

11. Abutilon Gaertn.

Leaves and branches white with closely felted down; flowers yellow; capsules almost glabrous . . . *indicum.*

Leaves and branches hispid with spreading hairs; flowers orange; capsules hairy . . . . . *graveolens* var. *hirtum.*

11. **Abutilon indicum** G. Don; F. B. I. i. 326. *Sida indica* F. I. iii. 179. E. D. A 89.

Northern clearings, rare, *Calcutta Garden Collectors*! *Prain*!

Vernac. *Potári, Kanghí.*

A shrubby weed; stems give a tolerable fibre; juices demulcent and diuretic; seeds said to be laxative.

DISTRIB.—Cosmopolitan, or nearly so, in the Tropics.

12. **Abutilon graveolens** G. Don. VAR. **hirtum** Mast.; F. B. I. i. 327.—*Sida graveolens* F. I. iii. 179. E. D. A 84.

Northern clearings, very rare, *Calcutta Garden Collectors*!

Vernac. *Bar Potári, Bara Kanghí.*

A shrubby weed with a heavy odour; properties as in *A. indicum.*

DISTRIB.—Tropical and subtropical regions of the Eastern Hemisphere and Australia.

12. Malachra Linn.

13. **Malachra capitata** Linn.; F. B. I. i. 329. E. D. M 60.

In all the northern clearings, plentiful.

Vernac. *Ban Bhindi, Ban Dheras.*

An erect annual, apparently recently introduced to India; yields a soft and silky but apparently not very valuable fibre.

DISTRIB.—Tropical America; also Tropical West Africa, but there, as in India, probably introduced.

13. Hibiscus Med.

Free portion of bracteoles twice the length of their cupular base; carpels 2-locular at their bases only; stipules large, spathulate; flowers yellow with rose-pink veins . . . . *tortuosus.*

Free portion of bracteoles much shorter than their cupular base; carpels completely 2-locular throughout; stipules medium, lanceolate; flowers yellow with crimson eye, changing to brownish red . . . . . *tiliaceus.*

14. **Hibiscus tortuosus** Wall. (not of Roxb.).

"Estuary of the Hughli," *Wallich* (*Catalogue* n. 1913 A: 1817)!

This plant has only once been collected in an apparently wild state. It grows well in the Calcutta Gardens, where there are some old and large specimens. It has the habit, the pubescence, and much the appearance of *H. tiliaceus*, but has the large stipules and exactly the flowers of *H. macrophyllus* which is, however, a tree, sometimes of considerable size. The fruit, which forms freely, is curiously intermediate between the fruit of *H. tiliaceus* and *H. macrophyllus*. In *H. tiliaceus* the five carpels are each completely subdivided by accessory partitions into 10 chambers; in *H. macrophyllus* the five carpels show no trace of such subdivision. In *H. tortuosus* there are partial dissepiments in each carpel. This intermediate character, with the fact that in the Calcutta Garden the seeds of *H. tortuosus* are always abortive, gives rise to the suspicion that we may have here to do with a natural hybrid between *H. tiliaceus*, the common *Bhola* and *H. macrophyllus* which, though not a Sundribun plant, occurs in Chittagong. In any case *H. tortuosus* should be looked for, more especially in the eastern parts.

15. **Hibiscus tiliaceus** Linn.; F. I. iii. 192; F. B. I. i. 343. *H. tortuosus* F. I. iii. 192. *H. tiliaceus* var. *tortuosus* F. B. I. i. 343. E. D. H 255.

Plentiful everywhere, from the northern border to the sea-face.

Vernac. *Bhola, Chelwa.*

A heavy climber, injurious to forest growth: the inner bark yields a strong fibre, used by the wood-cutters for cordage.

DISTRIB.—Cosmopolitan on tropical coasts.

14. Thespesia Corr.

16. **Thespesia populnea** Corr.; F. B. I. i. 345. *Hibiscus populneus* F. I. iii. 190. E. D. T. 392.

Coast; at Tiger Point, *Heinig*! but chiefly west of the Raimangal river (*Heinig*).

Vernac. *Dumbla* (*Heinig*); *Paras; Paras Pipal.*

A handsome tree, reaching 30 feet in height; wood good; inner bark yields a fair fibre; capsules give a yellow dye.

DISTRIB.—Tropical sea-coasts of the Eastern Hemisphere.

IX.—STERCULIACEÆ.

15. Heritiera Ait.

17 **Heritiera minor** Roxb.; F. I. iii. 142. *H. Fomes* F. B. I. i. 363. E. D. H 134.

Everywhere from the northern forests to the sea.
Vernac. *Sundri.*

A small to medium tree, reaching 40-50 feet in height; wood excellent, hard, tough and durable, red in colour; used in boat-building, also for posts, planks, rafters, jhools and dabbas of boats, furniture and firewood; trunk often much buttressed; roots send up vertical blind suckers; charcoal obtained from this tree is used by gold and silver-workers.

DISTRIB.—Delta of the Irrawaddy and (*fide* Masters *in F. B. I.*) Borneo.

Heritiera littoralis *Dryand.*, stated in the F. B. I., and in various other works on Indian Botany, to occur on the coasts of Bengal, has never been collected in the Sundribuns.

16. Kleinhovia Linn.

18. **Kleinhovia Hospita** Linn., F. I. iii. 141; F. B. I. i. 364. E. D. K 27.
Sundribuns, *Ellis*!
Vernac. *Bhola.*

A tall handsome tree; bark provides coarse rope (*Ellis*).

DISTRIB.—E. Tropical Africa; Malaya; Philippines.

Unfortunately Mr. Ellis, who alone has sent Sundribun specimens of this tree, does not give a precise locality. The species was not introduced to the Calcutta Garden, from the Moluccas, till 1798; it can hardly then be a species in some now abandoned clearing. The tree does not occur in existing clearings; the distribution of the species is precisely that of many of the species truly wild in the Sundribuns; there is, therefore, nothing against *Kleinhovia* being a genuine Sundribun plant. At all events the tree deserves to be carefully looked for again.

X.—TILIACEÆ.

17. Brownlowia Roxb.

19. **Brownlowia lanceolata** Benth.; F. B. I. i. 381. E. D. B 895.
Widely disseminated but nowhere very plentiful; chiefly found on the banks of creeks and rivers, *Griffith*! *Heinig*! *Prain*!
Vernac. *Kedar Sundri; Bhola Sundri.*

A small to medium tree, in leaf rather resembling *Sundri*; wood used as fuel.

DISTRIB.—Tenasserim.

18. Corchorus Linn.

20. **Corchorus acutangulus** Lamk.; F. B. I. i. 398. *C. fuscus* F. I. ii. 582. E. D. C 1840.
Northern clearings, not common, *Clarke*! *Prain*!
Vernac. *Titapát.*

An annual herb, rather resembles jute; properties unimportant.

DISTRIB.—Tropics of Eastern Hemisphere; West Indies.

DISCIFLORÆ.

XI.—GERANIACEÆ.

19. Oxalis Linn.

21. **Oxalis corniculata** Linn.; F. I. ii. 457; F. B. I. i. 436. E. D. o 547.

Northern clearings, very rare, *Heinig & Gammie*!

Vernac. *Chuka Tripati; Amrul.*

A small weed of cultivated ground with 'trefoil' leaves; properties not very important; slightly acid and refrigerant or tonic; sometimes used as a vegetable.

DISTRIB.—Cosmopolitan in cultivated ground.

XII.—RUTACEÆ.

20. Glycosmis Corr.

22. **Glycosmis pentaphylla** Corr.; F. B. I. i. 499. *Limonia pentaphylla* F. I. ii. 381. E. D. G 27:.

Northern clearings, *Calcutta Garden Collectors*! ruins of Mandabari, *Heinig & Gammie*! ruins of Jatta, *Prain*!

Vernac. *Ashhoura.*

A shrub, evergreen; fruit eaten; twigs used as tooth-cleaners.

DISTRIB.—S.-E. Asia; Australia.

This species is a common constituent of village shrubberies in the Gangetic plain and is an almost certain indication, when it occurs elsewhere, of former human habitation.

21. Micromelum Bl.

23. **Micromelum pubescens** Bl.; F. B. I. i. 501. *Bergera integerrima* F. I. ii. 376.

Eastern Sundribuns, *fide Roxburgh.*

Vernac. *Ban-kunch.*

A small, much-branched tree.

DISTRIB.—S.-E. Asia; Polynesia.

Roxburgh says that the tree occurs on the eastern banks of the mouth of the Megna; it might, therefore, be looked for on the opposite or western banks, from Shabuzpur northwards.

22. Paramignya Wight.

24. **Paramignya longispina** Hook. f.; F. B. I. i. 511.

Eastern Sundribuns, at Baniakhali, *Heinig*!

Vernac. *Ban Nimbu.*

A thorny under-shrub; fruit used in cases of colic.

DISTRIB.—Malayan Peninsula.

23. Ægle Corr.

25. **Ægle Marmelos** Corr.; F. I. ii. 579; F. B. I. i. 516. E. D. A 534.

Jatta, among the ruins, *Prain*!

Vernac. *Bél, Vilva.*

A medium to large tree; yields a gum; also a dye from the rind of the fruit; timber white, hard but not durable; fruit medicinal, when unripe astringent, when ripe cooling and mildly laxative; used in dysentery. The tree is sacred; this perhaps explains its existence beside an abandoned temple.

DISTRIB.—Drier parts of India.

XIII.—MELIACEÆ.

24. Amoora Roxb.

26. **Amoora cucullata** Roxb.; F. B. I. i. 560. *Andersonia cucullata* F. I. ii. 212. E. D. A 983.

General, in swamp-forests, from the northern border to the sea-face.

Vernac. *Amúr; Latmi, Natmi.*

A considerable tree, 30-40 feet high; wood hard, apt to split, of red or brown colour, used for posts and fuel; leaves when bruised applied to reduce inflammation; roots with vertical blind suckers.

DISTRIB.—Andamans; Malay Peninsula.

25. Carapa Aubl.

Roots with vertical blind suckers; evergreen; bark smooth; flowers February-March; fruits the size of an orange
moluccensis var. *gangetica.*

Roots with no root-suckers; deciduous; bark rough; flowers most of the year; fruits the size of a shaddock . . . *obovata.*

27. **Carapa moluccensis** Lamk VAR. **gangetica.**

Forests east of the Arpangassia, in swampy localities, *Heinig*! *Lace*!

Vernac. *Pussur.*

A tree 60 feet high; leaves fall after the new flush so that the species is practically evergreen; bark dark-brown, moderately exfoliating, deep-red within; wood white, reddening on exposure, hard, used for tool-handles, hand-spikes, helves, wheel-spokes, house-posts, planking; withstands moisture. The tree exudes a clear, brown, brittle gum: the fruit yields an illuminating and lubricating oil. The roots send up copious blind root-suckers.

This is, at least, a very distinct variety of *C. moluccensis* and may prove to be a distinct species; the shape of the leaflets is different, though the texture is much the same. The flowers, however, are the same in size and structure and it further agrees with typical *C. moluccensis* in the size of its fruit and in its habit of sending up blind root-suckers. In the Sundribuns this tree affects only the lowest parts of the interior of the swampy islands. The leaflets, though with more rounded

bases than those of *C. obovata*, and though of distinctly thinner texture, nevertheless more resemble these in general shape than they do the leaflets of any hitherto known variety of *C. moluccensis*. They are more obtuse at the apex than is the case with *C. moluccensis* var. *elliptica* Koord. & Val.; our tree further differs from that well-marked form in having only 2—1-jugate leaves, just as in *C. obovata*, never 3-jugate leaves. The form most nearly related to var. *gangetica* appears to be the Java tree named provisionally *C. moluccensis* var. *ovalifolia* by Koorders and Valeton. Our material of this last variety is not, however, sufficiently extensive for a definite decision to be arrived at; so far as it goes it indicates that the two varieties, *gangetica* and *ovalifolia*, are not the same; in any case no characters have been given for var. *ovalifolia*. According to Schimper, whose very careful account of the Strand-flora, based chiefly on Malayan observations, has become classical, *C. moluccensis* in muddy places sends up blind root-suckers, like *Sonneratia*, *Avicennia*, etc.* This is not the writer's recollection with regard to the form usually accepted as typical *C. moluccensis*, so far as the Coco Group is concerned; the tree in question there affects rocky headlands only and does not accompany *C. obovata* into the swamp-forests: this was also the experience of Kurz as regards the tree in the Andamans.†

28. **Carapa obovata** Bl. *C. moluccensis* F. B. I. i. 567 partly, not of Lamk. *Xylocarpus Granatum* F. I. ii. 240. E. D. C 482.
Everywhere throughout the Sundribuns, on river-banks.
Vernac. *Dhundol; Gamur; Karam Bhola.*

A tree occasionally 40 feet high, usually smaller than the last species; leaves deciduous; bark light-brown, freely exfoliating in large broad flakes, light-red within; wood reddish-brown much resembling that of the preceding in qualities. The fruit is used in tanning; the roots have no root-suckers but form instead horizontal thicked sections that protrude through the mud (as in *Gengwa*) to act as respiratory organs.

DISTRIB.—S.-E. Asia on banks of muddy sea-creeks.

XIV.—OLACINEÆ.

26. Olax Linn.

29. **Olax scandens** Roxb.; F. I. i. 163; F. B. I. i. 575. E. D. O 127.
Northern forests, *Heinig*!
Vernac. *Koko Aru.*

A large woody climber; properties unimportant.

DISTRIB.—S.-E. Asia.

XV.—CELASTRINEÆ.

27. Salacia Linn.

30. **Salacia prinoides** DC.; F. B. I. i. 626. *Johnia coromandeliana* F. I. i. 169.

* Schimper: *Die indo-malayische Strand-flora*, p. 99 (1891).
† Kurz: *Forest Flora of British Burma*, i, 226 (1877).

General, especially in the northern forests, but never common.
Vernac. *Chot-boroni; Modhu-phal; Dimal.*

A large climber or small straggling tree, 20 feet high ; only used for fuel.
DISTRIB.—S.-E. Asia.

XVI.—RHAMNACEÆ.

28. Zizyphus Juss.

Leaves glabrous on upper side, woolly below . . *Jujuba.*
Leaves softly pubescent above, silky below . . *Œnoplia.*

31. ***Zizyphus Jujuba** Lamk.; F. I. i. 608; F. B. I. i. 632. E. D. z 231.
Occasionally in clearings.
Vernac. *Bér.*

A small tree ; often planted, here certainly so : fruit of very poor quality.
DISTRIB.—Tropics of Eastern Hemisphere and of Australia.

32. **Zizyphus Œnoplia** Mill.; F. I. i. 611 ; F. B. I. i. 634. E. D. z 263.
Jatta, *Prain* !
Vernac. *Shiakol.*

A straggling shrub, useful as a hedge-plant ; fruit eaten, but quality poor.
DISTRIB.—Tropical Asia and Australia.
Here the species is probably a remnant of cultivation near the old temple.

XVII.—AMPELIDEÆ.

29. Vitis Linn.

Leaves simple :—
Stems 4-winged, fleshy . . . . *quadrangularis.*
Stems not winged, not fleshy . . . *latifolia.*
Leaves 3-foliolate . . . . . *trifolia.*

33. **Vitis quadrangularis** Wall.; F. B. I. i. 645. *Cissus quadrangularis* F. I. i. 407.
Satkhira, *Clarke*!
Vernac. *Harjora.*

A succulent almost leafless climber ; properties insignificant.
DISTRIB.—Tropical E. Africa ; S.-E. Asia.

34. **Vitis latifolia** Roxb.; F. I. i. 661 ; F. B. I. i. 652. E. D. v 213.
Jatta, *Prain* !
Vernac. *Govila.*

A large climber ; stems may be twisted into ropes.
DISTRIB.—India generally ; Assam.
A species almost certainly introduced by bird-agency.

35. **Vitis trifolia** Linn. *V. carnosa* F. B. I. i. 654. *Cissus carnosa* F. I. i. 409. E. D. v 195.

Everywhere common, from the northern clearings to the sea-face.
Vernac. *Goeli-lata ; Amal-lata.*

A slender climber ; stems twisted into ropes.
Distrib.—S.-E. Asia.

30. Leea Linn.

36. **Leea sambucina** Willd. ; F. I. i. 657 ; F. B. I, i. 666. E. D. L 241.

Eastern forests, *Heinig & Gammie* !
Vernac. *Kukur Jhiwa.*

A glabrous shrub ; properties unimportant.
Distrib.—S.-E. Asia ; N. Australia.

XVIII.—SAPINDACEÆ.

31. Cardiospermum Linn.

37. **Cardiospermum Halicacabum** Linn. ; F. I. ii. 292 ; F. B. I. i. 670. E. D. C 551.

Northern clearings, rare, *Prain* !

A slender climbing herb ; roots and seeds used medicinally.
Distrib.—Almost cosmopolitan in the Tropics.

32. Allophylus Linn.

38. **Allophylus Cobbe** Bl. VAR. **glabra** F. B. I. i. 672. *Ornithotrope glabra* F. I. ii. 267. E. D. A 787.

Sundribuns, *T. Thomson* !

A deciduous shrub ; properties unimportant.
Distrib.—S.-E. Asia ; N. Australia.
This has not been collected in the Sundribuns for half a century ; it might be looked for. It is plentiful in the Andaman sea-fence.

33. Aphania Bl.

39. **Aphania Danura** Radlk. *Scytalia Danura* F. I. ii. 274. *Sapindus Danura* F. B. I. i. 684.

Eastern and northern forests, *Clarke* ! *Heinig* ! *Calcutta Garden Collectors* !

Vernac. *Badona ; Nuncha.*

An evergreen shrub ; cut for firewood.
Distrib.—India ; Indo-China.

XIX.—ANACARDIACEÆ.

34. Bouea Meissn.

40. **Bouea burmanica** Griff.; F. B. I. ii. 21. *Mangifera oppositifolia* F. I. i. 640. E. D. B 785.

Sundribun, "reserved forests," *fide Heinig.*

Vernac. *Miri-ám; Uri-ám.*

A timber tree 50 feet high, used for constructing parts of boats above the water-line; fruit edible.

DISTRIB.—Pegu; Tenasserim; Andamans; Java.

Of this species, which is given in Mr. Heinig's list, no specimens have ever been received in the Calcutta Herbarium from the Sundribuns. In response to an enquiry on the subject Mr. Heinig has kindly replied as follows:—"I regret that I have lost all recollection of *Bouea burmanica*, but I find the following among my notes of Sundribuns species:—*B. burmanica*. Occurrence doubtful. Probably introduced. Cultivated near villages for the sake of its fruit."

The species should, therefore, be again looked for. Mr. Heinig suggests that it would probably be found, if it occurs at all, on the mounds or raised platforms of higher grounds forming vestiges of the old salt-makers and dacoits, especially near the ruins not far from Cobaduk Revenue Station in Coupe No. 1 of the Khulna Working Circle, on the left bank of the Mandabari river.

35. Odina Roxb.

41. **Odina Wodier** Roxb.; F. I. ii. 293; F. B. I. ii. 29. E. D. O 38.

Northern clearings, self-sown or planted, *Calcutta Garden Collectors*! *Prain*! Mandabari ruins, *Heinig & Gammie*! Jatta ruins, *Prain*! Ambaria khal, at a small cleared camping-ground, *Prain*! Sea-face, *Heinig*!

Vernac. *Jíyal; Kamila-gách.*

An ill-favoured deciduous tree, 40-50 feet high; wood hard but not durable; bark astringent.

DISTRIB.—India; Indo-China.

The sea-face locality is based on the presence at Calcutta of a specimen, in leaf only, sent by Mr. Heinig as Kamila-gách. There does not seem to the writer to be much doubt as to the accuracy of his determination; the communication of an unusual vernacular name still, however, leaves some; having regard to this fact and to the further doubt whether *Odina* deserves to be considered other than a deliberately introduced species in the Sundribuns, complete botanical material of the tree known as Kamila-gách is desirable.

CALYCIFLORÆ.

XX.—LEGUMINOSÆ.

36. Crotalaria, Linn.

Leaves simple:—

Flowers blue and white, in lateral as well as terminal racemes; leaves ovate . . . . . *verrucosa.*

Flowers yellow, in terminal racemes only ; leaves oblanceolate-oblong . . . . . *retusa.*

Leaves 3-foliolate ; flowers yellow, mostly in long terminal racemes . . . . . *Saltiana.*

42. **Crotalaria verrucosa** Linn. ; F. B. I. ii. 77. *C. angulosa* F. I. iii. 273. E. D. C 2164.

Frequent in northern clearings, *Calcutta Garden Collectors* ! *Prain* ! also on the coast at Tiger Point, *Heinig* !

Vernac. *Ban Çan.*

A shrubby herb ; properties unimportant.

Distrib.—Trop. Asia, Africa and America.

43. **Crotalaria retusa** Linn. ; F. I. iii. 272 ; F. B. I. ii. 75. E. D. C 2155.

Coast, at Tiger Point, *Heinig* !

Vernac. *Chotka ; Bhil Jhanjhan.*

A robust shrubby herb ; yields a tolerable fibre.

Distrib.—Trop. Asia ; introd. in Trop. Africa and America.

Seeds almost certainly washed down by the rivers.

44. **Crotalaria Saltiana** Andr. *C. striata* F. B. I. ii. 84 partly. E. D. C 2159.

Sea-face, *Lace* ! Northern clearings, *G. Thomson* ! *Calcutta Garden Collectors* !

An erect shrubby herb ; gives a fair fibre.

Distrib.—Trop. America and Africa ; S.-E. Asia.

37. Cyamopsis DC.

45. ***Cyamopsis psoraloides** DC. ; F. B. I. ii. 92. *Dolichos fabæformis* F. I. iii. 316. E. D. C 2514.

Sundribuns, cultivated, *Calcutta Garden Collectors* !

Vernac. *Guar.*

An annual crop ; plants erect, stoutish, 2-3 feet high, with thick straight fleshy pods. Probably only occasionally cultivated in Sundribun clearings, as it has not been reported from these since 1845.

Distrib.—India generally, in the drier regions ; and Afghanistan.

38. Sesbania Pers.

46. ***Sesbania grandiflora** Pers. ; F. B. I. ii. 115. *Æschynomene grandiflora* F. I. iii. 331. E. D. S. 1186.

Planted at almost every clearing.

Vernac. *Bok-phul ; Agati.*

A soft-wooded, quick-growing, short-lived tree, planted to support climbing vegetables ; also leaves and flowers eaten.

Distrib.—Mascarenes to Malaya and N. Australia.

39. **Desmodium** Desv.

47. **Desmodium umbellatum** DC.; F. B. I. ii. 161. *Hedysarum arboreum* F. I. iii. 360.

Generally distributed, but nowhere plentiful.

A large shrub or small tree; used for firewood.

DISTRIB.—Mascarenes; coasts of S.-E. Asia; Polynesia.

40. **Abrus** Linn.

48. **Abrus precatorius** Linn.; F. I. iii. 258; F. B. I. ii. 175. E. D. A 51.

Jatta, *Prain*!

Vernac. *Kúnch.*

A climbing plant with slender stems; seeds used as goldsmiths' weights (*rati*), and as ornamental and rosary beads; root medicinal.

DISTRIB.—Cosmopolitan in the Tropics.

The species is more or less sacred, which may explain its occurrence beside the ruined temple at Jatta.

41. **Teramnus** Sw.

49. **Teramnus flexilis** Benth.; F. B. I. ii. 185.

Eastern Sundribuns, rare, *Clarke*!

A somewhat extensive climber; properties unimportant.

DISTRIB.—E. Himalaya; Assam; Chittagong.

This has only been found east of the Madumati, but may be expected to occur also on the western bank. From the distribution of the species it is possible that the seeds may have been brought down by the Brahmaputra or some of its tributaries.

42. **Mucuna** Adans.

50. **Mucuna gigantea** DC.; F. B. I. ii. 186. *Carpopogon giganteum* F. I. iii. 286.

Eastern Sundribuns, at Arpangassia Khal, Cheila Bogi River and elsewhere, *Kurz*! *Heinig*! *Gammie*! *Lace*!

A very extensive climber; stems twisted into ropes.

DISTRIB.—Coast forests of S.-E. Asia.

43. **Erythrina** Linn.

1 **Erythrina indica** Lamk.; F. I. iii. 249; F. B. I. ii. 188. E. D. E 342.

Sea-face, *Heinig*!

Vernac. *Palita Mandar.*

A tall prickly tree, quick-growing, soft-wooded but the wood rather durable.

DISTRIB.—Coasts of S.-E. Asia and Polynesia: elsewhere planted.

44. Canavalia DC.

Pods not turgid, deeply double-channelled along dorsal suture *lineata.*

Pod turgid, almost flat along dorsal suture, endocarp separating *turgida.*

52. **Canavalia lineata** DC. *C. obtusifolia* F. B. I. ii. 196 (not of DC.) *Dolichos obcordatus* F. I. iii. 303. E D. C 294.
Sea-face, *Heinig*!

A glabrous perennial; a good sand-binding species.
DISTRIB.—Cosmopolitan on tropical coasts.

53. **Canavalia turgida** Grah. *C. ensiformis* var. *turgida* F. B. I. ii. 196. *Dolichos rotundifolius* F. I. iii. 302.
Common on river-banks in the central and northern forests.

A rather extensive climber, always near the sea.
DISTRIB.—Coasts of S.-E. Asia.

45. Phaseolus Linn.

Stipules attached by their bases; considerable climbers with entire leaflets and large white and purple flowers . *adenanthus.*

Stipules attached by their centres; small prostrate herbs with three-lobed leaflets and small yellow flowers . . . *trilobus.*

54. **Phaseolus adenanthus** Mey.; F. B. I. ii. 200. *P. alatus* F. I. iii. 288 (not of Linn.) E. D. P 484.
River-banks of northern forests and clearings.
Vernac. *Ban Barbati.*

A rather extensive climber; root tuberous, sometimes eaten.
DISTRIB.—Cosmopolitan in the Tropics.

55. **Phaseolus trilobus** Ait.; F. I. iii. 298; F. B. I. ii. 201. E. D. P 523.
Northern clearings, occasional. *Kurz*! *Clarke*! *Prain*!
Vernac. *Mugáni.*

A small wild pulse; a tolerable fodder.
DISTRIB.—Africa and Asia in tropical and subtropical regions.

46. Vigna Savi.

56. **Vigna luteola** Benth.; F. B. I. ii. 205. *Dolichos gangeticus* F. I. iii. 310.
General.
Vernac. *Ban Barbati.*

A trailing or climbing perennial; properties unimportant.
DISTRIB.—Cosmopolitan in the Tropics, near the coast.

47. Atylosia W. & A.

57. **Atylosia scarabæoides** Benth.; F. B. I. ii, 215. *Dolichos scarabæoides* F. I. iii. 315. E. D. R 347.

Jatta, *Prain*!

Vernac. *Banur Kalai.*

A slender biennial climber; eaten by cattle, otherwise valueless.

Distrib.—Mascarenes; S.-E. Asia.

48. Flemingia Roxb.

58. **Flemingia congesta** Roxb.; F. I. iii 340; F. B. I. ii. 228. E. D. F 633.

"Delta of the Ganges," *Meyne* (1796) *fide Roxburgh.*

Vernac. *Bara Salphan.*

An erect woody shrub; properties unimportant.

Distrib.—S.-E. Asia.

The *locus classicus* for this species is given by Roxburgh as the "Delta of the Ganges"—the term generally employed by him when speaking of the Sundribuns. The species has never been reported again from this area; it might, however, be looked for with a view to confirming Roxburgh's record.

49. Dalbergia Linn. f.

Branches spinescent; a usually erect shrub . . *spinosa.*
Branches unarmed; a considerable climber . . *torta.*

59. **Dalbergia spinosa** Roxb.; F. I. iii. 233; F. B. I. ii. 238. E. D. D 84.

General, on river-banks and near the sea-face.

Vernac. *Amanta.*

A thorny, sometimes climbing shrub; properties unimportant.

Distrib.—Coasts of Chittagong, Burma and Coromandel.

60. **Dalbergia torta** Grah. *D. monosperma* F. B. I. ii. 237. E. D. D 48.

General, especially plentiful in the eastern forests.

Vernac. *Panchioli.*

A scandent shrub; cut for firewood.

Distrib.—Coasts of S.-E. Asia; N. Australia; Polynesia.

50. Pongamia Vent.

61. **Pongamia glabra** Vent.; F. B. I. ii. 240. *Galedupa indica* F. I. iii. 239. E. D. P 1121.

General, on river-banks and in the forests, as far as the sea.

Vernac. *Pitajora; Koronja; Kerran; Dalkirancha.*

A tree, up to 50 feet high ; wood white, turning yellow on exposure, hard, but liable to attack by insects ; bark yields a gum ; seed yields an oil (*Karanj-ka-tél*) used for burning and greatly used in native medicine for skin-diseases.

DISTRIB.—Mascarenes ; coasts of S.-E. Asia ; Polynesia ; elsewhere often planted.

51. **Derris** Lour.

Vexillary stamen free ; sutures of pod sinuate between the seeds *sinuata.*

Vexillary stamen more or less united with the others ; pod not sinuate between the seeds :—

Pod narrow, pointed at both ends, several-seeded *scandens.*

Pod suborbicular, obtuse ; seeds solitary . . *uliginosa.*

62. **Derris sinuata** Thw. ; F. B. I. ii. 246 !

Sea-face, at Tiger Point, *Heinig* !

Vernac. *Sundri-lata ; Mahajani-lata.*

A large climber ; stems twisted into ropes for tying logs.

DISTRIB.—India ; Indo-China ; Malaya : in coast forests.

63. **Derris scandens** Benth. ; F. B. I. ii. 241. *Dalbergia scandens* F. I. iii. 232. E. D. D 330.

General.

Vernac. *Nioisha, Noa-lata.*

A large climber ; properties unimportant.

DISTRIB.—S.-E. Asia ; N. Australia : not confined to the coasts.

64. **Derris uliginosa** Benth. ; F. B. I. ii. 241. *Galedupa uliginosa* F. I. iii. 243.

General.

Vernac. *Kelia-lata ; Pan-lata.*

A large evergreen scandent shrub ; stems twisted into ropes for tying logs.

DISTRIB.—E. Africa ; Mascarenes ; S.-E. Asia ; Polynesia : on coasts and on muddy banks of tidal rivers.

52. **Cæsalpinia** Linn.

Pod covered with wiry prickles ; petals narrow . *Bonducella.*

Pod smooth ; petals broad . . . . . *Nuga.*

65. **Cæsalpinia Bonducella** Flem. ; F. I. iii. 357 ; F. B. I. ii. 254. E. D. C 6.

Sea-face ; on skirts of forests ; also in clearings for cultivation, *Calcutta Garden Collectors* ! *Heinig* !

Vernac. *Nátá ; Nátá Karanj.*

A large thorny climber ; seeds, ground and mixed with pepper, are taken in cases of fever ; also worn as necklaces.

DISTRIB.—Cosmopolitan in the Tropics.

66. **Cæsalpinia Nuga** Ait.; F. B. I. ii. 277. *C. paniculata* F. I. ii. 364. E. D. C 30.

Everywhere, from northern clearings to sea-face, common.

Vernac. *Nátua; Nétu; Shingri-lata.*

A prickly scandent shrub; properties unimportant.

DISTRIB.—Coasts of S.-E. Asia; N. Australia; Polynesia.

53. Mezoneuron Desf.

67. **Mezoneuron cucullatum** W. & A.; F. B. I. ii. 258. *Cæsalpinia cucullata* F. I. ii. 358.

"Delta of the Ganges," *Carey* (1796) *fide Roxburgh.*

A very extensive prickly climber, destructive to forest-growth.

DISTRIB.—S.-E. Asia; Malaya.

As in the case of *Flemingia congesta*, the *locus classicus* for this species is the "Delta of the Ganges." It has not been obtained again in the Sundribuns, but should be carefully looked for.

54. Parkinsonia Linn.

68. * **Parkinsonia aculeata** Linn.; F. B. I. ii. 260. E. D. P 322.

Planted in some of the northern clearings.

Vernac. *Belati Kikar.*

A hedge plant; yields fair fuel and makes good charcoal.

DISTRIB.—Native of Tropical America.

55. Cassia Linn.

Trees, with indehiscent, cylindric, woody pods; stamens 10 *Fistula.*
Herbs or shrubs, with dehiscent, compressed pods; stamens 7:—
Leaves with a single large gland near base of common petiole; leaflets 6-12 pairs; a small shrub . . . *Sophera.*
Leaves with two glands, one between each of the lower pairs of leaflets; leaflets 3 pairs; an annual herb . . *Tora.*

69. **Cassia Fistula** Linn.; F. I. iii. 333; F. B. I. ii. 261. E. D. C 756.

Jatta, among ruins, *Prain*! also "Reserved Forests," *fide Heinig* in list.

Vernac. *Shongrál* (*Heinig*); *Amaltas.*

The "Indian Laburnum," a handsome tree, 50 feet high; wood red, hard, used for posts, rice-pounders and the like; bark used for dyeing and tanning.

DISTRIB.—S.-E. Asia: often planted.

Mr. Heinig includes this in his list but has not sent specimens. Replying to an enquiry regarding the tree, Heinig writes:—"As for *Cassia Fistula* I have got a note:—'An introduced, not an indigenous species.' So far as I recollect (although at this time, six years after my departure from the Sundribuns, I cannot feel sure) I found the species on those mounds or platforms of higher ground forming vestiges of the old salt-makers or dacoits, and would

especially look for it near the ruins not far from the Cobaduk Revenue Station, in Coupe No. 1 of the Khulna Working Circle, on the left bank of the Mandabari river." The occurrence of the tree among the ruins round the Jatta temple is in keeping with Heinig's conclusion that it is only an introduced species in the Sundribuns.

70. **Cassia Sophera** Linn.; F. B. I. ii. 262. *Senna sophora* F. I. ii. 347. E. D. C 787.

Sea-face at Tiger Point, *Heinig*!

Vernac. *Kálanchi* (*Heinig*); *Kalkashonda.*

A shrubby weed; properties medicinal, cathartic.

DISTRIB.—Cosmopolitan in the Tropics, probably a native of Asia. Its occurrence at Tiger Point may be explained by its seeds having been brought down by one of the great rivers.

71. **Cassia Tora** Linn.; F. B. I. ii. 263, in part. *Senna Tora* F. I. ii. 340. E. D. C 797.

Northern clearings, *Calcutta Garden Collectors*! *Prain*!

Vernac. *Chakunda.*

A gregarious weed; yields a dye; properties also medicinal, cathartic.

DISTRIB.—Cosmopolitan in the Tropics.

56. Cynometra Linn.

72. **Cynometra mimosoides** Wall. *C. ramiflora* var. *mimosoides* F. B. I. ii. 267. E. D. C 2577.

Abundant throughout the central and eastern forests, *Calcutta Garden Collectors*! *Home*! *Heinig*! *Prain*! *Lace*!

Vernac. *Shingar; Shingra.*

A tree 20 feet high; wood hard, red, used in making carts, also for posts, and as fuel. Where this species occurs the seedlings of Sundri do not thrive, owing to its spreading and umbrageous habit.

DISTRIB.—Coasts of W. India; Ceylon; Burma; Andamans; Malaya.

57. Tamarindus Linn.

73. ***Tamarindus indica** Linn.; F. I. ii. 215; F. B. I. ii. 273. E. D. T 28.

Very occasionally planted in the northern clearings.

Vernac. *Tintuli; Imli.*

A large tree usually; in the Sundribun clearings small and not thriving; timber excellent but difficult to work; fruits acid and laxative; seeds yield an oil on expression.

DISTRIB.—Generally planted in the Tropics.

58. Intsia Thouars.

74. **Intsia bijuga** O. Kuntze. *Jonesia triandra* F. I. ii. 220. *Afzelia retusa* F. B. I. ii. 274.

General, but not plentiful in the central and eastern forests, *Heinig*! *Heinig & Gammie*! *Prain*!

Vernac. *Bhiála; Bháila; Bhádala; Shundal; Somdal; Hinga; Hingeh.*

A tree 30-40 feet high; wood reddish-brown, hard; used for beams, girders of bridges, house-posts, and fuel: the tree coppices freely.

DISTRIB.—Coast-forests of the Mascarenes; Indo-China; Malaya; Polynesia: not elsewhere in India.

59. **Entada** Adans.

75. **Entada Pursaetha** DC. *E. scandens* F. B. I. ii. 287. *Mimosa scandens* F. I. ii. 554. E.D. E 219.

Eastern forests.

Vernac. *Gila.*

A large climber; seeds roasted and eaten.

DISTRIB.—Cosmopolitan in the Tropics.

Though included in Heinig's list, specimens of this have not been sent from the Sundribuns: Heinig's record is, however, confirmed by the existence of an excellent coloured drawing of the plant in the Sundribun Forest office.

60. **Acacia** Linn.

Erect; branches armed with stipular spines:—

Flowers yellow; pod thickened and sinuate between the seeds . . *arabica.*

Flowers purple; pod thin, flat and not sinuate . . . *tomentosa.*

Climbing; branches without spines but armed with many recurved prickles:—

Flowers yellowish; pod thick, succulent, somewhat depressed between the seeds . . . . . *concinna.*

Flowers whitish; pod thin, coriaceous and flat . *Intsia.*

76. ***Acacia arabica** Willd.; F. B. I. ii. 293. *Mimosa arabica* F. I. ii. 557. E. D. A 101.

Occasionally planted in the northern clearings, *Calcutta Garden Collectors*! *Clarke*! *Prain*!

Vernac. *Babul; Kikar.*

A shrub or tree; wood good; yields an excellent gum; a good tan; and an indifferent dye.

DISTRIB.—Tropical Africa; India generally.

This is only planted in Sundribun clearings and thrives very indifferently.

77. **Acacia tomentosa** Willd.; F. B. I. ii. 294. *Mimosa tomentosa* F. I. ii. 558. E. D. A 299.

Northern forests, *Calcutta Garden Collectors*!

A small tree; properties insignificant.

DISTRIB.—Western India and Ceylon; here almost certainly planted: collected in 1856, not received from the Sundribuns since.

78. **Acacia concinna** DC.; F. B. I. ii. 296. *Mimosa concinna* F. I. ii. 565. E. D. A 200.

Northern forests, *Calcutta Garden Collectors*!

Vernac. *Ban-ritha.*

A prickly scandent bush; pods used as a substitute for soap; also as a source of medicine.

DISTRIB.—S.-E. Asia: not collected in the Sundribuns since 1856.

79. **Acacia Intsia** Willd.; F. B. I. ii. 297. *Mimosa Intsia* F. I. ii. 565. E. D. A 233.

Northern forests, *Calcutta Garden Collectors*!

A large prickly climber, destructive to forest-growth.

DISTRIB.—India generally: not collected in the Sundribuns since 1845.

XXI.—DROSERACEÆ.

61. Aldrovanda Linn.

80. **Aldrovanda vesiculosa** Linn.; F. B. I. ii. 425. *A. verticillata* F. I. ii. 112.

Northern clearings, *Kurz*!

Vernac. *Malacca Jhangi.*

A floating aquatic, apparently very rare.

DISTRIB.—C. Europe; Australia.

A species, with a peculiarly detached distribution, unless it occurs, but has been overlooked, in intermediate localities. Roxburgh, writing prior to 1814 (not published till 1832), does not say it is rare; Voigt, writing in 1845, mentions his failure to find it near Calcutta. It was rediscovered by T. Thomson in 1855 in salt-pans south of Calcutta and just to the north of the Sundribun area, and again in 1867 by S. Kurz in salt-pans just within the northern boundary of our region.

XXII.—RHIZOPHOREÆ.

62. Rhizophora Linn.

Cymes longer than petioles, usually 3-flowered, from axils of leaves; flowers pedicelled; petals fleshy, woolly in front . . . *mucronata.*

Cymes shorter than petioles, unusually 2-flowered, from axils of fallen leaves; flowers sessile; petals thin, glabrous . . . . *conjugata.*

81. **Rhizophora mucronata** Lamk.; F. B. I. ii. 435. *R. Mangle* F. I. ii. 459. E. D. R 242.

Forests near the coast, and on banks of large rivers.

Vernac. *Khamo; Bhára; Bara Goran.*

A tree 25-35 feet high; wood red, hard, splits on seasoning, used only for fuel; fruit said to be edible; bark used in tanning.

DISTRIB.—Tropical shores of Eastern Hemisphere and Australia.

82. **Rhizophora conjugata** Linn.; F. B. I. ii. 436.

Forests near and at the coast, *Heinig & Gammie*!

Vernac. *Khamo; Bhára.*

A small tree or large shrub (*fide* F. B. I.); properties unimportant (*fide* E. D.).

DISTRIB.—Tropical shores of Eastern Hemisphere.

Our economic knowledge of the species of *Rhizophoreæ* is singularly incomplete. The present species is excluded from Heinig's list; Clarke correctly includes it as a Sundribun species. It should be noted in passing that Heinig & Gammie, as specimens named by the latter in Herb., Calcutta, show, took the species to be "R. mucronata," a circumstance that throws considerable doubt on the accuracy of the F. B. I. statement regarding the size of the tree, and on the justice of the E. D. conclusion as to its want of economic importance.

Both these points, and the further question as to its abundance or otherwise in the Sundribuns, require investigation by local officers.

63. Ceriops Arn.

83. **Ceriops Roxburghiana** Arn.; F. B. I. ii. 436. E. D. C 972.

General, especially in the western forests, *Calcutta Garden Collectors*! *T. Thomson*! *Gamble*! *Heinig*! *Prain*! *Lace*!

Vernac. *Gorán; Guttia.*

A tree, 12-20 feet high; wood brick-red, hard, used for house-posts and firewood; makes excellent charcoal; the bark affords a red dye and is used in tanning.

DISTRIB.—Tropical shores of the Eastern Hemisphere.

Our economic knowledge of the species of *Ceriops* is as inadequate as is that of the species of *Rhizophora*. Both Heinig and Clarke include *C. Candolleana*, as well as *C. Roxburghiana*, in their lists of Sundribun species; on what authority it is difficult to say, since no collector has hitherto sent specimens of *C. Candolleana* to Herb., Calcutta. Heinig, indeed, speaks of *C. Candolleana* as the more important and plentiful of the two; his own specimens, however, as well as those of Gamble distributed under the name *C. Candolleana*, prove on examination to be *C. Roxburghiana*. There is no obvious reasons why *C. Candolleana* should not occur, and under the circumstances it deserves to be carefully looked for; it may be distinguished from the very common *C. Roxburghiana* by its more pointed calyx-segments and its glabrous petals with 3-4 capitate bristles at their emarginate tips. The calyx-lobes of *C. Roxburghiana* are blunter; its concave petals, though glabrous below, are setose-ciliate towards the apex.

64. Kandelia W. & A.

84. **Kandelia Rheedei** W. & A.; F. B. I. ii. 437. E. D. K 21.

General, i forests near coast and on banks of the larger rivers.

Vernac. *Goria.*

A tree 20 feet high; wood soft, used in charcoal-making; bark yields a dye.
DISTRIB.—Shores of S.-E. Asia.

65. Bruguiera Lamk.

Peduncles 1-flowered; calyx-teeth about 12, as long as the tube in the fruiting stage . . . . . *gymnorhiza.*
Peduncles many-flowered; calyx-teeth about 8, much shorter than the tube in the fruiting stage . . . . . *parviflora.*

85. **Bruguiera gymnorhiza** Lamk; F. B. I. ii. 437. *Rhizophora gymnorhiza* F. I. ii. 460. E. D. B 898.
General, in forests near coast and on banks of the larger rivers.
Vernac. *Kankra.*

A tree 40 feet high; wood red-brown, hard, employed for beams, posts, planks, jhools and dabbas of boats, also as fuel; bark used for tanning.
DISTRIB.—Tropical shores of Eastern Hemisphere and Polynesia.
As will be seen in connection with the species that follows our economic knowledge of the *Bruguieras* is as imperfect as our knowledge of *Rhizophora* or *Ceriops.*

86. **Bruguiera parviflora** W. & A.; F. B. I. ii. 438. *Rhizophora parviflora* F. I. ii. 461.
"Delta of the Ganges," *Goodlad* (1796) *fide Roxburgh.*

A much smaller species than the true *Kankra;* qualities unrecorded, but probably similar to those of the other "Mangroves." Roxburgh's record of the occurrence of this tree in the Sundribuns is very precise, and though it has apparently never been met with in our area since it was obtained by Goodlad in 1796 it deserves to be looked for.
DISTRIB.—Shores of Indo-China and Malaya.

XXIII.—COMBRETACEÆ.

66. Lumnitzera Willd.

87. **Lumnitzera racemosa** Willd.; F. B. I. ii. 452. *Petaloma alternifolia* F. I. ii. 372. E. D. L 576.
General, at the sea-face and on river-banks.
Vernac. *Kirpa; Kripa.*

A tree, reaching 40 feet in height but usually much smaller; wood hard and durable, withstanding moisture, used for rafters and posts, and as fuel; makes a very good charcoal.
DISTRIB.—Shores of Indo-China; Malaya; N. Australia; Polynesia.

XXIV.—MYRTACEÆ.

67. Eugenia Linn.

88. **Eugenia fruticosa** Roxb.; F. I. ii. 487; F. B. I. ii. 499.

Forests, not common, *fide Heinig.*

Vernac. *Ban-jamb.*

A large shrub or small tree; cut for firewood.

DISTRIB.—Assam; Chittagong; Pegu; Tenasserim.

Heinig includes this in his list, but has not sent any specimens. The tree occurs in E. Bengal and there is no reason why it should not extend naturally into the northern forests. At the same time it may belong to the category in which *Bouea burmanica, Ægle Marmelos, Cassia Fistula, Diospyros Embryopteris* ought perhaps to be placed, and may indicate the remains of clearings that at one time existed but that have been re-invaded by forest.

68. Psidium Linn.

89. ***Psidium Guyava** Linn.; F. B. I. ii. 468. *P. pomiferum* F. I. ii. 480. *P. pyriferum* F. I. ii. 480. E. D. P 1343.

Northern clearings, planted.

Vernac. *Piyára.*

A small tree, cultivated for its fruit.

DISTRIB.—Native of America, now cosmopolitan in the Tropics.

69. Barringtonia Forst.

Calyx valvate; fruit ovoid, when ripe slightly 4-angled near the base *racemosa.*

Calyx somewhat imbricate; fruit oblong, fusiform, markedly 4-angled throughout . . . . . *acutangula.*

90. **Barringtonia racemosa** Bl.; F. I. ii. 634; F. B. I. ii. 507. E. D. B 193.

Near river-banks, especially in the northern forests, *Calcutta Garden Collectors*! *Heinig*! *Prain*!

Vernac. *Kumia; Samandra.*

A tree, reaching 50 feet in height; wood white and soft, only used as fuel.

DISTRIB.—Shores of S.-E. Asia and Polynesia.

91. **Barringtonia acutangula** Gærtn.; F. I. ii. 635; F. B. I. ii. 508. E. D. B 180.

Northern clearings, *Calcutta Garden Collectors*! also on river-banks, associated with *B. racemosa, fide Heinig.*

Vernac. *Hidjal.*

A tree 20-30 feet high; wood hard, reddish, durable but apt to warp and not much used; affords an indifferent tan.

DISTRIB.—S.-E. Asia generally; N. Australia: not a coast species.

Mr. Heinig reports a third species of *Barringtonia*, B. speciosa *Forst.*, as associated with *B. racemosa.* The species may be distinguished from the two preceding ones by its entire leaf-margins—in *B. racemosa* and *B. acutangula* the leaf-margins are crenate-denticulate, and by its much larger showy white flowers and very large quadrangular or nearly ovoid fruit. No specimens of

B. speciosa have, however, been sent to the Calcutta Herbarium, and its presence in these forests is therefore doubtful. There would be nothing to cause surprise in the existence of *B. speciosa* in the Sundribuns; it should, however, be recollected that in the Andamans and elsewhere the species seems confined to the beach-zone of the littoral forest. It may be looked for along the Sundribun sea-face, but its occurrence associated with *B. racemosa* on river-banks in the northern forests would be at least unusual. The species ought, however, to be carefully searched for.

XXV.—LYTHRACEÆ.

70. Ammannia Linn.

92. **Ammannia salicifolia** Monti; F. B. I. ii. 569.
Northern clearings, *Clarke*! *Heinig & Gammie*!
Vernac. *Dád Mari.*

A weed of wet places, properties unimportant.
Distrib.—India generally; Trop. Africa.

71. Sonneratia Linn. f.

Leaves narrow-oblong; calyx 4-lobed; petals 0; stigma very wide-umbellate . . . . . *apetala.*
Leaves oblong or obovate-elliptic; calyx 6-lobed; petals 6; stigma capitate, not very large . . . . . *acida.*

93. **Sonneratia apetala** Ham.; F. I. ii. 506; F. B. I. ii. 579. E. D. S 2369.
Banks of tidal rivers, most plentiful east of the Raimangal.
Vernac. *Keora.*

A gregarious tree, 50-60 feet high; wood reddish-brown, hard, used for indoor planks, furniture, boxes, jhools and dabbas of boats, also for fuel and charcoal. The roots send up vertical blind suckers.
Distrib.—Coast of W. India, and of Indo-China.

94. **Sonneratia acida** Linn. f.; F. I. ii. 506; F. B. I. ii. 579. E. D. S 2362.
Banks of rivers, principally in the northern forests.
Vernac. *Ora.*

A gregarious tree; wood soft, grey, only to use as fuel; the fruit is eaten and used as a fish-bait. The roots send up blind suckers.
Distrib.—Western India; Indo-China; Malaya: on coasts, and on banks of tidal rivers.

XXVI.—TURNERACEÆ.

72. Turnera Linn.

95. **Turnera ulmifolia** Linn.
Northern clearings, *Calcutta Garden Collectors*! *Heinig*!

A small under-shrub, escaped from gardens; has showy yellow flowers but is of no economic importance.

DISTRIB.—Native of America; generally naturalised throughout S.-E. Asia.

XXVII.—PASSIFLOREÆ.

73. Passiflora Linn.

96. **Passiflora suberosa** Linn.; F. B. I. ii. 599.
Northern clearings, *Calcutta Garden Collectors!*

A common herbaceous climber; properties unimportant.

DISTRIB.—Native of America: very plentiful everywhere, naturalised, in Lower Bengal. First reported from the Sundribuns in 1845.

XXVIII.—CUCURBITACEÆ.

74. Trichosanthes Linn.

Bracts of the male flowers small or none; leaves puberulous or pubescent beneath . . . . . *cucumerina.*
Bracts of the male flowers large and sheathing; leaves glabrous beneath . . . . . *palmata.*

97. **Trichosanthes cucumerina** Linn.; F. I. iii. 702; F. B. I. ii. 609 E. D. F 576.
Northern clearings, cultivated and self-sown, *Calcutta Garden Collectors*!
Vernac. *Ban Chichinga.*

A large herbaceous climber; the bitter fruit is often eaten cooked.

DISTRIB.—S.-E. Asia; N. Australia.

98. **Trichosanthes palmata** Roxb.; F. I. ii. 704; F. B. I. ii. 606. E. D. T 600.
Jatta, among ruins, *Prain*!
Vernac. *Makál.*

A large herbaceous climber; fruit when pounded used as an external application in diseases of the ear.

DISTRIB.—S.-E. and E. Asia; N. Australia.

75. Luffa Cav.

99. **Luffa graveolens** Roxb.; F. I. iii. 716; F. B. I. ii. 614.
Jatta, among ruins, *Prain*!

A herbaceous climber; properties unimportant.

DISTRIB.—E. Himalaya; Tirhut and N. Bengal; Chittagong.

76. Momordica Linn.

100. **Momordica dioica** Roxb.; F. I. iii. 709; F. B. I. ii. 617. E. D. M 639.

Jatta, among ruins, *Prain*!

A herbaceous climber; fruit and tuberous root sometimes eaten.
DISTRIB.—S.-E. Asia.

77. Cucumis Linn.

101. **Cucumis trigonus** Roxb.; F. I. ii. 722; F. B. I. ii. 619. E. D. C 2298.

Northern clearings, not uncommon, *Calcutta Garden Collectors*! *Prain*!

A herbaceous climber; root tuberous; properties unimportant.
DISTRIB.—Tropical and subtropical Asia.
Whether this is the wild plant from which the cultivated melon has been derived, or is a condition of the melon 'feral by reversion' is not absolutely clear, but, in the writer's opinion, the latter is the more probable explanation of its origin, so far at least as Bengal is concerned.

78. Cephalandra Schrad.

102. **Cephalandra indica** Naud.; F. B. I. ii. 621. *Momordica monadelpha* F. I. iii. 708. E. D. C 919.

Northern clearings, frequent, *Calcutta Garden Collectors*! *Prain*!
Vernac. *Bhimbu*; *Tela Kucha*.

A herbaceous climber; fruit eaten cooked when green and fresh when ripe.
DISTRIB.—Tropical Africa; S.-E. Asia.

79. Zehneria Endl.

103. **Zehneria umbellata** Thw.; F. B. I. ii. 625. *Momordica umbellata* F. I. iii. 710. E. D. Z 182.

Northern forests, *Heinig*!
Vernac. *Kudari*.

A herbaceous climber; fruit sometimes eaten.
DISTRIB.—S.-E. Asia; N. Australia.

XXIX.—FICOIDEÆ.

80. Sesuvium Linn.

104. **Sesuvium Portulacastrum** Linn.; F. I. ii. 509; F. B. I. ii. 659. E. D. S 1203.

Locally plentiful on muddy banks, *Calcutta Garden Collectors*! *Prain*! Sea-face, plentiful, *Heinig*! *Prain*!
Vernac. *Noona*; *Gangatora-ság*.

An extensively creeping plant; a tolerable mud-binding and an excellent sand-binding species.
DISTRIB.—Cosmopolitan on tropical shores.

81. Trianthema Linn.

105. **Trianthema monogyna** Linn.; F. B. I. ii. 660. *T. obcordata* F. I. ii. 445. E. D. T 537.

Northern clearings, occasional, *Calcutta Garden Collectors*! *Prain*!

A field-weed; properties unimportant.

DISTRIB.—Cosmopolitan in the Tropics.

COROLLIFLORÆ.

XXX.—RUBIACEÆ.

82. Oldenlandia Linn.

106. **Oldenlandia diffusa** Roxb.; F. I. i. 423; F. B. I. iii. 65.

Northern clearings, not uncommon, *Calcutta Garden Collectors*! *Prain*!

A diffuse weed; properties unimportant.

DISTRIB.—S.-E. and E. Asia.

83. Petunga DC.

107. **Petunga Roxburghii** DC.; F. B. I. iii. 120. *Randia racemosa* F. I. i. 525.

Northern and western forests, *Calcutta Garden Collectors*! *Home*! *Gamble*! *Heinig*! Eastern forests, *Lace*!

Vernac. *Pitanga; Jhijir; Narkheli; Ban Chár.*

A large shrub or small tree, 15 feet high; wood white, hard, used for making boxes and native furniture.

DISTRIB.—Indo-China; Malaya: in swamp-forests.

84. Vangueria Juss.

108. **Vangueria spinosa** Roxb.; F. I. i. 536; F. B. I. iii, 136. E. D. V 25.

Northern forests, exact locality not given, *Heinig*!

Vernac. *Moyena.*

A large thorny shrub; fruit eaten.

DISTRIB.—India; Indo-China; Malaya.

Possibly an originally introduced species, and one of the group to which *Diospyros Embryopteris, Cassia Fistula, Ægle Marmelos, Bouea burmanica,* etc., belong.

85. Ixora Linn.

Flowers white, small, in lax branching cymes . . *parviflora.*

Flowers red, larger, in condensed corymbose cymes . . . *coccinea* var. *Bandhuca.*

109. **Ixora parviflora** Vahl; F. I. i. 383; F. B. I. iii. 142. E. D. 1515.

Sea-face, *Heinig & Gammie*!

Vernac. *Rangan.*

An evergreen tree; wood light-brown, hard, close-grained; used for fuel.

DISTRIB.—India and Indo-China.

This species is common in the hotter and drier parts of India and Burma; its presence in the locality where Heinig and Gammie collected it (near Tiger Point) is most probably due to its seeds having been brought down by the great rivers from Upper India.

110. **Ixora coccinea** Linn. VAR. **Bandhuca**; F. B. I. iii. 145. *I. Bandhuca* F. I. i. 376. E. D. 1513.

Northern clearings, planted, *Heinig*!

Vernac. *Rangan.*

A shrub; used largely in native medicine for dysentery, which possibly explains its presence.

DISTRIB.—Indo-China, wild: widely cultivated in S.-E. Asia.

86. Morinda Linn.

111. **Morinda bracteata** Roxb.; F. I. i. 544. *M. citrifolia* var. *bracteata* F. B. I. iii. 156. E. D. M 656.

River-banks, and sea-face, *Calcutta Garden Collectors*! *Ellis*! *Heinig*! *Lace*!

Vernac. *Bara Chánd.*

A small tree; cut for firewood.

DISTRIB.—Tenasserim and Andamans in the coast-forests, plentiful: elsewhere planted. It extends as a wild shrub along the banks of the Hughli as far north as Calcutta.

XXXI.—COMPOSITÆ.

87. Vernonia Schreb.

112. **Vernonia cinerea** Less.; F. B. I. iii. 233. *Serratula cinerea* F. I. iii. 406. E. D. V 79.

Northern clearings, *Calcutta Garden Collectors!* Jatta, among ruins, *Prain!*

Vernac. *Kúk-shim; Kalajira.*

A common weed; properties obscure.

DISTRIB.—Tropics of Eastern Hemisphere.

88. Ageratum Linn.

113. **Ageratum conyzoides** Linn ; F. B. I. iii. 243. *A. cordifolium* F. I iii. 415.

Northern clearings, at Chandpie only, *Heinig & Gammie*! but there plentiful, *Prain*!

Vernac. *Oochunti.*

A common weed; properties unimportant.
DISTRIB.—Cosmopolitan in the Tropics; originally American.

89. Grangea Forsk.

114. **Grangea maderaspatana** Poir.; F. B. I. iii. 247. *Artemisia maderaspatana* F. I. iii. 412. E. D. G 660.

Northern clearings, *Kurz*! *Heinig & Gammie*!

Vernac. *Namuti.*

A common weed; properties obscure.
DISTRIB.—Tropical and sub-tropical regions of the Eastern Hemisphere.

90. Conyza Less.

115. **Conyza semi-pinnatifida** Wall. ; F. B. I iii. 257.

Northern clearings, *Calcutta Garden Collectors*!

A common weed; properties unimportant. This has also been found by Mr. Clarke at Barisal in the Sundribun region east of the Madumati.
DISTRIB.—Assam, Burma; on the banks of large rivers.

91. Blumea DC.

116. **Blumea amplectens** DC.; F. B. I. iii. 260; VAR. **maritima.**

Northern clearings, *Kurz*! *Clarke*! *Heinig & Gammie*!

A spreading weed; properties unimportant.
DISTRIB.—India; Indo-China: always near the sea or on the coast.

92. Pluchea Cass.

117. **Pluchea indica** Less.; F. B. I. iii. 272. *Coryza corymbosa* F. I. iii. 426.

General, in open places.

Vernac. *Munjhú Rukha; Kukronda.*

A low shrub; properties unimportant.
DISTRIB.—S.-E. Asia: on coasts and in maritime swamps.

93. Sphæranthus Linn.

118. **Sphæranthus africanus** Linn.; F. B. I. iii. 275. *S. indicus* F. I. iii. 446 not of Linn.

Northern clearings, very common.

Vernac. *Khatta Palang.*

A coarse weed; properties unimportant.

DISTRIB.—Tropics of Eastern Hemisphere.

94. Xanthium Linn.

119. **Xanthium spinosum** Linn.

Banks of Mátla river, abundant, *Calcutta Garden Collectors*!

A spiny weed; properties obscure.

DISTRIB.—Native of S. Europe; recently introduced but now thoroughly established and abundant: so far, not recorded from any other part of India.

95. Wedelia Jacq.

Leaves 3-nerved; inner bracts of the involucre bluntish; a considerable climber . . . . . *scandens.*

Leaves not 3-nerved; inner bracts of the involucre distinctly pointed; a prostrate or creeping herb . . . . *calendulacea.*

120. **Wedelia scandens** Clarke. *W. biflora* F. B. I. iii. 306, not of DC. *Verbesina scandens* F. I. iii. 441.

River-banks and sea-face, climbing over bushes.

A considerable climber; properties unimportant.

DISTRIB.—S.-E. Asia; on coasts.

121. **Wedelia calendulacea** Less.; F. B. I. iii. 306. *Verbesina calendulacea* F. I. iii. 440. E. D. W 25.

Muddy banks; at Baniakhali, *Heinig*! Cheila, *Heinig & Gammie*! Ambaria Khal, *Prain*! Chandpie, *Prain*!

Vernac. *Kesaraj; Bhimraj.*

A weed of wet places; properties medicinal, used internally for coughs, externally as a stimulant for growth of hair and in skin diseases; an excellent mud-binding plant.

DISTRIB.—S.-E. and E. Asia.

96. Cnicus Linn.

122. **Cnicus arvensis** Hoffm.; F. B. I. iii. 362. *Carduus lanatus* F. I. iii. 408.

Northern clearings, general.

Vernac. *Shial-kanta.*

A common weed; properties unimportant.
DISTRIB.—N. India; Himalaya; N. Asia; Europe.

97. Launea Cass.

123. **Launea pinnatifida** Cass.; F. B. I. iii. 417. *Prenanthes asplenifolia* F. I. iii. 404 in part.

Sea-face, creeping on sand, *Calcutta Garden Collectors*!

A prostrate herb; an effective sand-binding species.
DISTRIB.—E. Africa; Mascarenes; S.-E. Asia: on sandy sea-shores.

XXXII.—PLUMBAGINEÆ.

98. Ægialitis R. Br.

124. **Ægialitis rotundifolia** Roxb.; F. I. ii. 111; F. B. I. iii. 479. E. D. A 5279.

South-western forests, abundant on edges of creeks, becoming less plentiful towards the east.

Vernac. *Sátári.*

A shrub or small tree; properties unimportant.
DISTRIB.—W. Indo-China; Malaya: in mangrove-swamps.

XXXIII.—MYRSINEÆ.

99. Ægiceras Gærtn.

125. **Ægiceras majus** Gærtn.; F. I. iii. 130; F. B. I. iii. 533. E. D. A 531.

River-banks and sea-face, very common.

Vernac. *Koilsha; Khalshi; Kulsi.*

A tree, reaching 20 feet in height; wood hard, only used as fuel.
DISTRIB.—Cosmopolitan on Tropical sea-shores.

XXXIV.—EBENACEÆ.

100. Diospyros Linn.

Leaves under 3 in. long, thin, herbaceous or papery, pubescent beneath; stamens 16; fruit glabrous *montana* var. *cordifolia.*
Leaves over 5 in. long, thick, coriaceous, glabrous; stamens 24 or more; fruit glandular or rusty-pubescent . . *Embryopteris.*

126. **Diospyros montana** Roxb.; F. B. I. iii. 555: VAR. **cordifolia.** *D. cordifolia* F. I. ii. 538. E. D. D 628.

Jatta, among ruins, *Prain*!

Vernac. *Ban Gáb.*

A small to medium tree; wood yellowish grey; soft but durable.

Distrib.—S.-E. Asia; N. Australia: here most probably a tree originally introduced. This is almost certainly specifically distinct from *D. montana*.

127. **Diospyros Embryopteris** Pers. F. B. I. iii. 556. *D. glutinosa* F. I. ii. 533. E. D d 582.

Mandabari ruins, *Heinig;* Jatta, among ruins, *Prain*! Eastern Forests, *Lace*! *Heinig.*

Vernac. *Gáb; Makurkendi.*

An evergreen tree, reaching 60 feet in height. Wood white, hard; used for building, for masts and yards, and as fuel; the viscid pulp of the fruit is used to pay the seams of boats and to strengthen nets and cordage; it is full of tannin and is used in native medicine as an astringent; fruit also eaten.

Distrib.—S.-E. Asia.

As Heinig had not communicated specimens of this tree, which is stated in his list to be found in the reserved forests, but not to be common, and as the writer only met with it at Jatta it appeared possible that this might be only a survival, in *all* its localities, of abandoned settlements like that of Jatta. Consulted on the subject, Heinig has informed the writer that there are some fine Gáb trees (*Diospyros Embryopteris*) on the mounds or platforms of higher ground left by the old salt-makers or dacoits on the left bank of the Mandabari river. The properties of the Gáb, as will be seen, are just such as would lead to its having been planted by people of the class who once occupied these ruins. During a visit to the Sundribuns paid by Lace in January, 1903, it was, however, found that this *Diospyros* does occur in the swamp-forests in places where former settlement is not conceivable so that Heinig's record is already quite confirmed.

XXXV.—SALVADORACEÆ.

101. Azima Lamk.

128. **Azima tetracantha** Lamk.; F. B. I. iii. 620. E. D. a 1165.

Western river-banks and sea-face, *Calcutta Garden Collectors*!

Vernac. *Trikanta Gati.*

A thorny shrub; properties unimportant.

Distrib.—S. India; Mascarenes; S. Africa.

XXXVI.—APOCYNACEÆ.

102. Cerbera Linn.

129. **Cerbera Odollam** Gærtn.; F. I. i. 692; F. B. I iii. 638.

River-banks everywhere, fairly common.

Vernac. *Dákur; Dábur; Láko.*

A small tree, sometimes reaching 40 feet in height; wood white, soft, useless; seed yields an illuminating oil.

Distrib.—S.-E. Asia; Australia; Polynesia: in maritime swamps.

103. Parsonsia R. Br.

130. **Parsonsia spiralis** Wall. ; F. B. I. iii. 650.
General, *Heinig* ! *Heinig & Gammie* ! *Prain* !

A large climber ; properties unimportant.
DISTRIB.—S.-E. Asia.

XXXVII.—ASCLEPIADACEÆ.

104. Hemidesmus R. Br.

131. **Hemidesmus indicus** R. Br. ; F. B. I. iv. 5. *Asclepias pseudosarsa* F. I. ii. 39. E. D. H 119.
Northern forests, *Heinig* ! Jatta, *Prain* !
Vernac. *Ananta-mal.*

A twining shrub ; root medicinal.
DISTRIB.—India generally and Ceylon.

105. Finlaysonia Wall.

132. **Finlaysonia obovata** Wall. ; F. B. I. iv. 7.
Everywhere, rather common.
Vernac. *Dudhi-lata.*

A lofty climber ; stems twisted into ropes.
DISTRIB.—Shores of Indo-China and Malaya.

106. Oxystelma R. Br.

133. **Oxystelma esculentum** R. Br. ; F. B. I iv. 17. *Asclepias rosea* F. I. ii. 40. E. D. O 600.
Kagdip, *Calcutta Garden Collectors* !
Vernac. *Dudhia-lata.*

A slender glabrous twiner ; properties obscure.
DISTRIB.—India ; Indo-China ; Malaya.

107. Calotropis R. Br.

134. **Calotropis gigantea** R. Br. ; F. B. I. iv. 17. *Asclep iasgigantea* F. I. ii 30. E. D. C 170.
Northern clearings, apparently very rare, only a few plants observed at Rampura, *Prain* ! Sea-face at Tiger Point, plentiful, *Lace* !
Vernac. *Akanda ; Gurtákand ; Madár.*

An erect spreading shrub ; yields a fibre used for fishing lines ; also a dye ; the sap affords an inferior " Gutta " and is medicinal.
DISTRIB.—S. E. Asia.

108. Pentatropis R. Br.

135. **Pentatropis microphylla** W. & A.; F. B. I. iv. 20. *Asclepias microphylla* F. I. ii. 35. E. D. P 396.

Skirts of northern clearings, climbing over bushes, *Calcutta Garden Collectors* ! *Clarke* !

A small twiner; properties obscure.

DISTRIB.—India; Indo-China.

109. Dæmia R. Br.

136. **Dæmia extensa** R. Br.; F. B. I. iv. 20. *Asclepias echinata* F. I. ii. 44. E. D. D. 9.

Canning Town only, but there plentiful, on banks of Mátla river, *Calcutta Garden Collectors* ! *Prain* !

Vernac. *Chhagal Bati.*

A fœtid weedy climber; yields a fair fibre; said to be medicinal.

DISTRIB.—India generally; Afghanistan.

This is one of the usual constituents of the "village shrubberies" characteristic of Lower Bengal; in India it accompanies man as a weed.

110. Sarcolobus Wall.

Corolla white with a purplish tinge, lobes pubescent within; fruit large, globose, greyish-brown, coriaceous, not winged . . . *globosus,*

Corolla yellow with lines of brownish purple dots, nearly glabrous within; fruit small, ellipsoid, yellow, chartaceous, with longitudinal wing-like ridges . . . . . *carinatus.*

137. **Sarcolobus globosus** Wall. F. B. I. iv. 27.

Everywhere common, especially on river-banks, from the northern clearings to the sea.

Vernac. *Baoli-lata; Baoli-phal.*

A large climber; juice said by wood-cutters to be unwholesome.

DISTRIB.—Coasts of Indo-China and Malaya.

Heinig in his list states:—"The kernel of the ripe fruit is eaten." As the ripe fruit is filled with numerous subdiscoid seeds, there seemed to be here some mistake. Among Heinig's specimens is one of a plant termed "Baoli-phal," collected at Nalkora, regarding which he has noted "fruit eaten": unfortunately "Baoli-phal" has only leaves in a young condition, and the matter could not be satisfactorily settled. Recently, however, some Sundribun fishermen have brought fruiting specimens and have explained that they term the fruits "Baoli-phal" and eat the seeds, as well as the inside of the pericarp.

138. **Sarcolobus carinatus** Wall.; F. B. I. iv. 28.

Skirts of northern clearings and northern forests, common; not met with in the central or southern reserves.

Vernac. *Baoli-lati* (*fide Heinig*).

A small twiner; properties unimportant.
DISTRIB.—Coasts of W. Indo-China.

111. Dregea E. Mey.

139. **Dregea volubilis** Benth.; F. B. I. iv. 46. *Asclepias volubilis* F. I. ii. 36.

River-banks in Eastern forests, *Lace*!
Vernac. *Tita Kunja.*

A stoutish twiner; properties obscure.
DISTRIB.—Throughout India; Ceylon; Malaya.

112. Tylophora R. Br.

140. **Tylophora tenuis** Bl.; F. B. I. iv. 42. *Asclepias tenuissima* F. I. ii. 41.

Northern clearings and skirts of northern forests, very plentiful, *Kurz*! *Clarke*! *Prain*!

A slender prostrate or twining herb; properties obscure, said to be medicinal.
DISTRIB.—S.-E. Asia.

113. Dischidia R. Br.

141. **Dischidia Nummularia** R. Br.; F. B. I. iv. 49.

Bagirhat Reserve forests, epiphytic, *Heinig*!
Vernac. *Pargátcha.*

A small epiphytic twiner, rooting at the nodes; properties obscure.
DISTRIB.—Indo-China; Malaya; N. Australia.

114. Hoya R. Br.

142. **Hoya parasitica** Wall.; F. B. I. iv. 57. *Asclepias parasitica* F. I. ii. 42.

Everywhere throughout the forests, on trees; often very plentiful.
Vernac. *Pargátcha.*

A stout epiphytic climber; properties obscure; flowers waxy, sweet-scented.
DISTRIB.—Indo-China; Malaya.

XXXVIII.—GENTIANACEÆ.

115. Hoppea Willd.

143. **Hoppea dichotoma** Willd.; F. B. I. iv. 100. *Pladera pusilla* F. I. i. 403.

Northern clearings, locally abundant, *Heinig & Gammie*! *Calcutta Garden Collectors*! *Prain*!

A small herb; properties unimportant.

DISTRIB.—India generally; Assam; Chittagong.

116. Limnanthemum S. P. Gmel.

144. **Limnanthemum cristatum** Griseb.; F. B. I. iv. 131. *Menyanthes cristata* F. I. i. 459.

Northern clearings, occasional, *Prain*!

Vernac. *Pan-chuli; Chand Malla.*

A floating aquatic; properties obscure.

DISTRIB.—India; Indo-China; S. China.

XXXIX.—HYDROPHYLLACEÆ.

117. Hydrolea Linn.

145. **Hydrolea zeylanica** Vahl; F. B. I. iv. 133. *Nama zeylanica* F. I. ii. 73. E. D. H 504.

Northern clearings, *Heinig & Gammie*! *Calcutta Garden Collectors*!

Vernac. *Kasschra; Isha-langulia.*

A procumbent herb; properties obscure.

DISTRIB.—Cosmopolitan in the Tropics.

XL.—BORAGINEÆ.

118. Cordia Linn.

146. **Cordia Myxa** Linn.; F. I. i. 590; F. B. I. iv. 136. E. D. C 1931.

Chandpie, *Prain*!

Vernac. *Bohnari; Lashora.*

A medium tree; wood grey, only moderately hard, but durable and seasoning well, though liable to attacks by insects; fruit medicinal, mainly demulcent.

DISTRIB.—N. Africa; Tropical Asia; N. Australia; but often planted, as is the case in this instance.

119. Coldenia Linn.

147. **Coldenia procumbens** Linn.; F. I. i. 448; F. B. I. iv. 144. E. D. C 1717.

Sundribuns, *Clarke.*

A prostrate scabrous annual weed; properties obscure.

DISTRIB.—Cosmopolitan in the Tropics.

This species is included in Mr. Clarke's Sundribun list: there is no Sundribun specimen in the Calcutta Herbarium. It may be looked for in the Eastern

Sundribuns (Backerganj District) and in the northern clearings. The plant has alternate crisped leaves and usually lies quite flat on the ground.

120. Heliotropium Linn.

148. **Heliotropium indicum** Linn.; F. I. i. 454; F. B. I. iv. 152 E. D. H 102.

Suta Khal, in clearing, not common, *Prain*!

An annual herb, mostly on waysides and in waste-places, rarely in fields; properties unimportant.

DISTRIB.—Cosmopolitan in the Tropics.

Mr. Clarke's list of Sundribun plants includes also *Heliotropium ovalifolium*. This species is not present from the Sundribuns in the Calcutta Herbarium; it should be looked for in the northern and eastern clearings.

XLI.—CONVOLVULACEÆ.

121. Stictocardia Hallier f.

149. **Stictocardia tiliæfolia** Hallier f. *Argyreia tiliæfolia* F. B. I. iv. 184. *Convolvulus gangeticus* F .I. i. 467.

Banks of tidal rivers in western parts, *Kurz*! *Calcutta Garden Collectors*! Sea-face, *Heinig*!

A twining or climbing shrub; properties unimportant.

DISTRIB.—S.-E. Asia.

122. Merremia Dennst.

150. **Merremia hederacea** Hallier f. *Ipomœa polyantha* F. B. I. iv. 206.

Eastern Sundribuns, *Clarke*!

A twining shrub; properties unimportant.

DISTRIB.—Malaya.

123. Ipomœa Linn.

Flowers large, white; leaves ovate-cordate entire; seeds shaggy with long hairs along the angles; climbing . . . *longiflora*.

Flowers purple or, if whitish or pale purple, with at least a dark purple eye:—

Leaves palmately 5-7-lobed; seeds shaggy with long hairs along the angles; climbing . . . . *paniculata*.

Leaves not palmately or digitately lobed:—

Leaves orbicular, obtuse or emarginate or 2-lobed; seeds villous, but not shaggy with long hairs along the angles; plant creeping in sand . . *Pes-capræ*.

Leaves acute or acuminate at the tip:—

Floating on water or rooting in mud at edges of ponds; leaves elliptic, oblong-cordate or hastate, sometimes

slightly lobed ; seeds finely silky but not shaggy along the margins . . . . . *reptans.*

Climbing over bushes or trees ; leaves ovate-cordate : —

Leaves entire ; a heavy creeper with large pink-purple flowers ; seeds shaggy with long hairs along the angles . . . . . *illustris.*

Leaves more or less lobed ; a light creeper with pale-purple or sometimes nearly white flowers but with always a dark-purple eye ; seeds furred but not shaggy along the angles, *sepiaria* var. *stipulacea.*

151. **Ipomœa longiflora** R. Br. *I. grandiflora* F. B. I. iv. 198.
Sea-face, *Heinig*!

A large climber ; properties unimportant.
DISTRIB.—Coasts of S.-E. Asia ; Australia ; New Caledonia ; Polynesia.

152. **Ipomœa paniculata** R. Br. *I. digitata* F. B. I. iv. 202. *Convulvulus paniculatus* F. I. i. 478. E. D. 1 379.
Northern forests, *Prain !*
Vernac. *Bilai-kand* ; *Bhui-kumra.*

A large climber ; roots medicinal.
DISTRIB.—Cosmopolitan in the Tropics.

153. **Ipomœa Pes-capræ** Sweet *I. biloba* F. B. I. iv. 212. *Convulvulus Pes-capræ* F. I. i. 485. E. D. 1 362.
Sea-face, very common.
Vernac. *Chhagal-kuri.*

A prostrate herb ; an excellent sand-binding species.
DISTRIB.—Cosmopolitan in the Tropics.

154. **Ipomœa reptans** Poir. *I. aquatica* F. B. I. iv. 210. *Convulvulus repens* F. I. i. 432. E. D. 1 343.
Northern clearings, occasional, *Calcutta Garden Collectors*!
Vernac. *Kalmi Sák.*

A floating aquatic ; used as a vegetable.
DISTRIB.—Tropics of Eastern Hemisphere and Australia.

155. **Ipomœa illustris** Prain. *I. campanulata* var. *illustris*, F. B. I. iv. 211.
Sea-face, *Heinig*! Cheila Bogi river, *Heinig & Gammie*! Pussar and Ambaria rivers, *Prain*! Eastern river-banks, *Lace*!

A large climber with handsome flowers ; properties unimportant.
DISTRIB.—W. Indo-China ; Malaya : on coasts.

156. **Ipomœa sepiaria** Kœn. VAR. **stipulacea** F. B. I. iv. 209. *Convulvulus stipulaceus* F. I. i. 484.
Very common on the skirts of the northern forests and in the northern clearings.

Vernac. *Ban Kalmi.*

A slender climber; properties unimportant.
DISTRIB.—Lower Bengal; Chittagong.

124. Cuscuta Linn.

157. **Cuscuta reflexa** Roxb.; F. I. i. 446; F. B. I. iv. 225. E. D. c 2508.

Northern clearings and skirts of northern forests, *Calcutta Garden Collectors*! In central forests only noticed in one place, *Prain.*

Vernac. *Alag-lata.*

A parasitic leafless twiner; whole plant used in native medicine.
DISTRIB.—S.-E. Asia.

XLII.—SOLANACEÆ.

125. Solanum Linn.

Flowers white, small; leaves green on both sides, glabrous; plants without prickles . . . . . *nigrum.*

Flowers blue:—

Plants without prickles; leaves very white beneath *argenteum.*

Plants armed with prickles; leaves green:—

Spines long, straight; berry large, half an inch or more across; prostrate herbs . . . . *xanthocarpum.*

Spines short, recurved; berry rather small, one-third inch or less across; scandent under-shrubs . . *trilobatum.*

158. **Solanum nigrum** Linn.; F. B. I. iv. 229. *S. rubrum* F. I. i. 565. E. D. s 2299.

Northern clearings, rare, *Prain*!

Vernac. *Gurkhi*; *Gurkamai.*

A small under-shrub or herb; whole plant used in native medicine.
DISTRIB.—Cosmopolitan in temperate, sub-tropical and tropical regions.

159. **Solanum argenteum** Dun.

Abundant and thoroughly naturalized on banks of Mátla river, near Canning Town; *Calcutta Garden Collectors*! *Prain*!

A shrub, occasional in gardens; here wild and thoroughly established; properties obscure.
DISTRIB.—Native of S. America: here an escape.

160. **Solanum xanthocarpum** Schrad. & Wendl.; F. B. I. iv. 236. *S. diffusum* F. I. i. 568. *S. Jacquini* F. I. i. 569. E. D. s 2345.

Banks of Mátla river at Canning Town, *Prain*!

A diffuse very prickly herb; root and fruit reputed medicinal.
DISTRIB.—S.-E. Asia; Australia; Polynesia.

161. **Solanum trilobatum** Linn.; F. I. 571; F. B. I. i 236. E. D. s 2315.

General in the northern and western forests on river-banks and skirts of clearings.

A scandent under-shrub; root, leaves and fruit reputed medicinal.
DISTRIB.—S.-E. Asia: in or near tidal swamps.

XLIII.—SCROPHULARINEÆ.

126. Angelonia H. & B.

162. **Angelonia grandiflora** C. Morr.

Kagdip, rather common, *Prain*!

A "garden escape," though there are no gardens at Kagdip except that of the forest office, within which the species did not happen to occur. The same plant has been found by Kurz similarly established in places in the Irrawaddy Delta: the present is the first record of the species, other than as a garden plant, from Bengal.
DISTRIB.—Native of S. America.

127. Limnophila R. Br.

163. **Limnophila gratissma** Bl.; F. B. I. iv. 268.

Jatta, margin of the old temple tank, *Prain*!

An aquatic or marsh weed; properties unimportant.
DISTRIB.—S.-E. Asia.

128. Herpestis Gærtn. f.

164. **Herpestis Monnieria** H. B. K.; F. B. I. iv. 272. *Gratiola Monnieria* F. I. i. 141. E. D. H 149.

Northern clearings, general.
Vernac. *Adha Birni.*

A weed of marshy places; properties obscure.
DISTRIB.—Cosmopolitan in the Tropics.

129. Vandellia Linn.

165. **Vandellia crustacea** Benth.; F. B. I. iv. 279. *Torenia varians* F. I. iii. 96.

Northern clearings, occasional.

A weed of fields and waste places; properties unimportant.
DISTRIB.—Tropics of Eastern Hemisphere.

130. Scoparia Linn.

166. **Scoparia dulcis** Linn.; F. B. I. iv. 289.

Chandpie only, *Heinig & Gammie*! but there quite abundant, *Prain*!

An under-shrub; twigs used as tooth-brushes.

DISTRIB.—Native of America, now widespread in the Eastern Hemisphere and Australia.

XLIV.—LENTIBULARIACEÆ.

131. Utricularia Linn.

Peduncles with a whorl of oblong vesicles about the middle *stellaris.*

Peduncles naked or with a few obscure scales . *flexuosa.*

167. **Utricularia stellaris** Linn. f.; F. I. i. 143; F. B. I. iv. 328.

Ponds in northern clearings, rare.

Vernac. *Jhangi.*

A floating aquatic; properties unimportant.

DISTRIB.—Tropics of Eastern Hemisphere and N. Australia.

168. **Utricularia flexuosa** Vahl; F. B. I. iv. 329. *U. fasciculata* F. I. i. 143.

Ponds in northern clearings.

Vernac. *Jhangi.*

A floating aquatic; properties unimportant.

DISTRIB.—S.-E. Asia; N. Australia.

XLV.—BIGNONIACEÆ.

132. Dolichandrone Seem.

169. **Dolichandrone Rheedei** Seem.; F. B. I. iv. 379. E. D. D 753.

General, but never common, from the northern forests down to the coast, *Heinig*! *Prain*!

Vernac. *Gorshingiah.*

A tree, height 50 feet; wood white, soft, brittle; an indifferent fuel.

DISTRIB.—S.-E. Asia.

XLVI.—ACANTHACEÆ.

133. Hygrophila R. Br.

Unarmed herbs; calyx 5-toothed:—

Leaves lanceolate; capsule much longer than the calyx *quadrivalvis.*

Leaves obovate; capsule hardly longer than the calyx *phlomoides* var. *Roxburghii.*

Spinescent herbs; calyx 4-partite; leaves lanceolate . *spinosa.*

170. **Hygrophila quadrivalvis** Nees; F. B. I. iv. 408.

Chandpie, *Heinig & Gammie*!

A weed of marshy places; properties obscure.
DISTRIB.—India; Malaya; Indo-China.

171. **Hygrophila phlomoides** Nees VAR. **Roxburghii** F. B. I. iv. 408. *Ruellia obovata* F. I. iii. 51.
Common in the northern parts, *Hooker*! *Clarke*! *Kurz*! *Prain*!

A weed of marshy places; properties obscure.
DISTRIB.—Sub-Himalayan region; Bengal; Indo-China.

172. **Hygrophila spinosa** T. And.; F. B. I. iv. 408. *Ruellia longifolia* F. I. iii. 50. E. D. H 508.
Northern clearings, common.
Vernac. *Kanta Kalika; Kulia Khara.*

A spinous weed of wet places; properties obscure.
DISTRIB.—India generally: Andamans, but there probably introduced.

134. Hemigraphis Nees.

173. **Hemigraphis hirta** T. And.; F. B. I. iv. 422. *Ruellia hirta* F. I. iii. 46.
Northern clearings, very rare, *Prain*!

A prostrate weed; properties unimportant.
DISTRIB.—Gangetic Plain generally.

135. Acanthus Linn.

Leaves spinous; bracteoles broad; corolla blue; stems erect *ilicifolius.*
Leaves unarmed; bracteoles 0; corolla white with a yellowish tinge; climbing . . . . . *volubilis.*

174. **Acanthus ilicifolius** Linn.; F. I. iii. 32; F. B. I. iv. 481. E. D. A 324.
Everywhere on river-banks and in low swampy places within the forests.
Vernac. *Hargoza; Kintki.*

An under-shrub; an excellent mud-binding species.
DISTRIB.—S.-E. Asia and N. Australia: on coasts.
Heinig reports from the western forests another species with spinous leaves, *A. ebracteatus*, but no specimens of this have reached the Calcutta Herbarium. It should be looked for; it differs from *A. ilicifolius* in having no bracteoles.

175. **Acanthus volubilis** Wall.; F. B. I. iv. 481.
River-banks in the western forests, very rare, *Wallich*! *Calcutta Garden Collectors*! *Heinig*!

A climbing under-shrub; properties unimportant.
DISTRIB.—Indo-China; Malaya: on coasts.

XLVII.—VERBENACEÆ.

136. Lantana Linn.

Leaves usually in whorls of 3, sometimes opposite; branches covered throughout with spreading hairs . . . . *trifolia.*

Leaves usually opposite, sometimes in whorls of 3; branches scabrid with adpressed hairs . . . . . *indica.*

176. **Lantana trifolia** Linn.; F. B. I. iv. 563.

Eastern Sundribuns, at Barisal, *Clarke*!

A shrub, 3-8 feet high; a common weed on banks of rivers and creeks, of no economic importance. Though never yet recorded from the country between the Madumati and the Hughli, there is much likelihood that it occurs there; it ought to be searched for. Another reason for calling attention to the plant is the difficulty there is in distinguishing it from *Lantana indica*, and the further difficulty in distinguishing either of these *Lantanas* from *Lippia geminata*. The present is an American species, somewhat recently introduced to India.

177. **Lantana indica** Roxb.; F. I. iii 89; F. B. I. iv. 562.

Northern clearings, apparently very rare, *Calcutta Garden Collectors*!

A shrub 3-8 feet high; of no economic importance: exceedingly like the preceding species which is often only to be distinguished by its spreading pubescence. Though very common in Lower Bengal, outside the Sundribun area, it seems to have barely yet established itself in Sundribun clearings.

DISTRIB.—India generally; Beluchistan; Tropical Africa.

137. Lippia Linn.

Perennial, erect, softly strigose shrubs; leaves ovate-oblong, crenate; peduncles mostly opposite; bracts ovate-acuminate *geminata.*

Annual, creeping, minutely hairy herbs; leaves cuneate-spathulate, serrate; peduncles rarely opposite; bracts obovate-acute *nodiflora.*

178. **Lippia geminata** H. B. & K.; F. B. I. iv. 563.

Northern clearings, rare, *Heinig*!

A shrub 3-8 feet high; of no economic importance: resembles *Lantana indica* even more closely than *Lantana trifolia* sometimes does, and when in flower often hardly distinguishable. When in fruit *Lippia geminata* is recognised by its fruit separating into two 1-seeded pyrenes; the fruits of the two *Lantanas* remain entire and contain the two 1-seeded pyrenes. In the Gangetic Plain north of the Sundribuns this is even more common than *Lantana indica*, but like that species has as yet hardly established itself in the Sundribun clearings.

DISTRIB.—E. Bengal: native of America.

179. **Lippia nodiflora** Rich.; F. B. I. iv. 563. E. D. L 451.

Common in every clearing; occasional in suitable localities (upper margins of mud-banks) throughout the forests; also at the sea-face.

Vernac. *Bhui Okra.*

A prostrate herb; an excellent sand-binding and still more effective mud-binding species.

DISTRIB.—Cosmopolitan in tropical and sub-tropical regions.

138. Premna Linn.

180. **Premna integrifolia** Linn.; F. I. iii. 81; F. B. I. iv. 574. *P. serratifolia* F. I. iii. 77. *P. spinosa* F. I. iii. 77. E. D. P 1233.

River-banks, widely spread from the northern clearings to the sea, but not plentiful except at the sea-face, *Calcutta Garden Collectors*! *Gamble*! *Ellis*! *Prain*!

Vernac. *Goniári; Bhút Biravi.*

A shrub or small tree; wood white with reddish streaks, moderately hard; used as fuel.

DISTRIB.—Coasts of S.-E. Asia; E. Africa.

139. Vitex Linn.

Leaves 3-foliolate, and occasionally 1-foliolate; leaflets without petiolules, obovate and obtuse . . . . *trifolia.*

Leaves 5-foliolate, and occasionally 3-foliolate; leaflets with distinct petiolules, lanceolate and acute . . . *Negundo.*

181. **Vitex trifolia** Linn. f.; F. I. iii. 69; F. B. I. iv. 583. E. D. v 181.

Sea-face to the east of the river Madumati.

Vernac. *Pani Sanbhalu.*

A small deciduous tree or large shrub; wood greyish-white, hard; used as fuel.

DISTRIB.—S.-E. Asia; N. Australia.

Though this has not yet been recorded from the central or western Sundribuns, it grows in similar situations to *V. Negundo* in a locality so adjacent that there is no reason why it should not occur. The species should, therefore, be looked for. It is exceedingly like, and might easily be casually mistaken for, *V. Negundo.*

182. **Vitex Negundo** Linn.; F. I. iii. 70; F. B. I. 583. E. D. v 164.

Sea-face at Tiger Point and elsewhere, plentiful, *Heinig*! *Prain*!

Vernac. *Sanbhalu; Nishinda.*

A deciduous small tree or large shrub; wood greyish-white, hard; used as fuel.

DISTRIB.—S.-E. Asia; Afghanistan.

140. Clerodendron Linn.

Corolla irregularly salver-shaped, never exceeding an inch in length; panicles axillary:—

Leaves obovate or elliptic, sub-obtuse, opposite or very rarely in whorls of 3; calyx in fruit closely applied to the base of the berry *inerme.*

Leaves elliptic, acute, or linear-oblong, generally in whorls of 3; calyx in fruit somewhat spreading, the fruit considerably larger *neriifolium*.

Corolla narrowly funnel-shaped, never less than 3 inches in length; panicle terminal; leaves narrowly lanceolate . *Siphonanthus*.

183. **Clerodendron inerme** Gærtn.; F. I. iii. 58; F. B. I. iv. 589. E. D. C 1377.

Common on river-banks everywhere from the northern clearings to the sea, occasionally also in the forests.

Vernac. *Ban-jai; Ban-jám; Ban-jumet; Ban-modi; Butráj.*

An under-shrub; used as fuel.

DISTRIB.—India; Indo-China: on coasts.

184. **Clerodendron neriifolium** Wall.; F. B. I. iv. 589. *Volkameria neriifolia* F. I. iii. 64.

Sea-face, apparently very rare, *Heinig*!

An under-shrub; used as fuel.

DISTRIB.—Indo-China; Malaya; Philippines; Australia; China: on coasts.

185. **Clerodendron Siphonanthus** R. Br.; F. B. I. iv. 595. *Siphonanthus indica* F. I. iii. 67; E. D. C 1394.

Reserved forests, associated with *C. inerme, fide Heinig.*

Vernac. *Bámanhatti.*

A shrub, soft-wooded, useless.

DISTRIB.—S.-E. Asia: often planted.

This is given by Heinig in his list, but as no specimens of the plant have been sent, the record requires verification. It is possibly a plant of the same category as *Bouea, Cassia Fistula, Diospyros Embryopteris, Ægle*, etc.

141. Avicennia Linn.

Leaves obovate or elliptic obtuse, yellowish beneath; capsule broadly oblong obtuse . . . . . *officinalis*.

Leaves lanceolate acute, white beneath; capsule narrowly conical, acute . . . . . *alba*.

186. **Avicennia officinalis** Linn.; F. B. I. iv. 604. *A. tomentosa* F. I. iii. 88. E. D. A 1661.

Common everywhere from the northern borders to the sea-face.

Vernac. *Báen; Bani; Bina.*

A large timber-tree 40-60 feet high; wood dark-grey, hard, used for planking, beams, drain-pipes, sluices, oil-mills, jhools and dabbas of boats, and for fuel; exudes a gum applied to ulcers. The roots send up soft and pith-like blind root-suckers.

DISTRIB.—S.-E. Asia; N. Australia; Polynesia.

This is one of the tallest and is much the thickest of Sundribun species; the stems of old trees are very apt to become hollow. The structure of the wood

is somewhat peculiar, in that the fibres of any particular ring of growth do not pass vertically upwards, but instead diverge "herring-bone fashion" from an indistinct vertical linear raphe, which appears to correspond to the plane of an original branch, at an angle of about 15°, their upper ends blending in a much less definite raphe midway between two raphes of divergence. The raphes of divergence of the ring of growth next above and next below any particular ring alternate, so that in weathered trunks and to a less extent in freshly cut sound logs, a lace-work arrangement of the fibres of the various rings of growth presents itself. This configuration and arrangement is to be observed also in the bark of the *Bakayan*, where it is more immediately patent, though perhaps less definite.

The wood-cutters speak of the existence of four distinct Báens: so far as could be gathered one of these is *Avicennia alba*, Dudhi Báen, with acute leaves and narrow sharp-pointed capsules, which is certainly a very distinct species. The other three have obtuse leaves and broad capsules and are all apparently forms of the present species. The three forms are (1) the tree, 40-60 feet high, with a girth of 12-15 feet, which has sometimes ovate-obtuse, sometimes oblong-obtuse leaves; (2) the shrub or small tree with broader ovate-obtuse leaves; (3) the shrub or small tree with narrower oblong-obtuse leaves. These three are, however, only distinguishable by the characters indicated and exhibit no botanically distinctive characters.

87. **Avicennia alba** Bl. *A. officinalis* var. *alba* F. B. I. iv. 604. E. D. A 1665.

River-banks, very rare; at Malanchi, *Lace & Prain!* Nalkhora, *Prain*!

Vernac. *Dudhi Báen.*

A small shrub; used as firewood.

DISTRIB.—Coasts of W. India; Indo-China; Malaya; N. Australia.

XLVIII.—LABIATÆ.

142. Ocimum Linn.

Pedicels of individual flowers as long as calyx . . *sanctum.*
Pedicels of individual flowers shorter than the calyx . *Basilicum.*

188. **Ocimum sanctum** Linn.; F. I. iii. 14; F. B. I. iv. 609. E. D. 0 31.

Chandpie, *Heinig & Gammie*! Jatta, among ruins, *Prain*!

Vernac. *Túlsi.*

A herb or under-shrub; sacred.

DISTRIB.—Orient; S.-E. Asia: Australia; Polynesia.

189. **Ocimum Basilicum** Linn.; F. I. iii. 17; F. B. I. iv. 607. *O. pilosum* F. I. iii. 16. E. D. 0 18.

Rampura, *Prain*!

Vernac. *Babui Túlsi.*

A herb or under-shrub: medicinal, and used as a flavouring in cookery

DISTRIB.—Tropics of Eastern Hemisphere; Polynesia.

143. Anisomeles R. Br.

190. **Anisomeles ovata** R. Br.; F. B. I. iv. 672: VAR. **mollissima**. *Ajuga disticha* F. I. iii. 2. E. D. A 1136.
Jatta, among ruins, *Prain*!
Vernac. *Gobura*.
A coarse annual herb; properties obscure.
DISTRIB.—S.-E. Asia.

144. Leucas R. Br.

191. **Leucas linifolia** Spreng.; F. B. I. iv. 690. *Phlomis zeylanica* F. I. iii. 9. E. D. L 323.
Northern clearings, common.
Vernac. *Hal-kúsa; Guma*.
A herb; properties obscure.
DISTRIB.—Mauritius; S.-E. Asia.

INCOMPLETÆ.

XLIX.—AMARANTACEÆ.

145. Amarantus Linn.

Bracts awned, recurved, longer than the sepals; sepals 5; stamens 5 *paniculatus*.
Bracts acute but hardly awned, shorter than the sepals; sepals 3; stamens 3:—
Clusters of flowers both terminal and axillary; utricle with an acute tip . . . . . *viridis*.
Clusters of flowers, all axillary; utricle blunt *polygamus*.

192. ***Amarantus paniculatus** Linn.; F. B. I. iv. 718. *A. frumentaceus* F. I. iii. 610. E. D. A 925.
Canning Town, *Calcutta Garden Collectors*!
A large herb, 4-5 feet high; cultivated as a pot-herb.
DISTRIB.—Trop. Africa and Asia.

193. **Amarantus viridis** Linn.; F. I. iii. 605; F. B I. iv. 720. E. D. A 953.
Kagdip, *Prain*!
Vernac. *Tún-túni Nati*.
A weed; used as a pot-herb.
DISTRIB.—Cosmopolitan in the Tropics.

194. ***Amarantus polygamus** Linn.; F. B. I. iv. 721. *A. polygonoides* F. I. iii. 602. E. D. A 941.
Canning Town, *Calcutta Garden Collectors*!
Vernac. *Champa Nati*.

A small cultivated pot-herb.
DISTRIB.—Cosmopolitan in the Tropics.

146. Psilotrichum Bl.

195. **Psilotrichum ferrugineum** Moq.; F. B. I. iv. 725. *Achyranthes ferruginea* F. I. i. 675.
Northern and western parts, in clearings and on mud-banks.
Vernac. *Rakto Sirinchi.*

A weed; of no economic importance.
DISTRIB.—Common in Lower Bengal.

147. Alternanthera Forsk.

196. **Alternanthera sessilis** R. Br.; F. B. I. iv. 731. *Achyranthes triandra* F. I. i. 678. E. D. A 877.
Northern and western parts, in clearings and on mud-banks.

A weed; of little importance except as a mud-binding species.
DISTRIB.—Cosmopolitan in the Tropics.

L.—CHENOPODIACEÆ.

148. Salicornia Linn.

197. **Salicornia brachiata** Roxb.; F. I i. 84; F. B. I. v. 12 E. D. S 527.
Sundribuns, "on such low wet salt ground as is overflowed by the spring tides," *Roxburgh.*

A gregarious under-shrub; yields barilla; a good mud-binding species.
DISTRIB.—N. Ceylon; Coromandel Coast.

149. Arthrocnemum Moq.

198. **Arthrocnemum indicum** Moq.; F. B. I. v. 12. *Salicornia indica*, F. I. i. 85. E. D. A 1475.
Sundribuns, "grows with the former (*Salicornia brachiata*) and on similar ground," *Roxburgh.*
Vernac. *Jadu Palang.*

A gregarious prostrate undershrub; yields barilla; a mud-binding species.
DISTRIB.—Trop. Africa; coasts of India both west and east.

150. Suæda Forsk.

199. **Suæda maritima** Dumort.; F. B. I. v. 14. *Salsola indica* F. I. ii. 62. E. D. S 2990.
General, on muddy banks.

An erect herb; sometimes used as a vegetable.
DISTRIB.—Asia generally; Europe; N. Africa; N. America.

151. Basella Linn.

200. **Basella rubra** Linn, F. B. I. v. 20. *B. alba* F. I. ii. 104. E. D. B 203.

Clearings, cultivated; at Chandpie and Canning Town, also feral, *Prain*!

Vernac. *Poi Ság; Ban Poi.*

A much-branched twining herb: a favourite vegetable.
DISTRIB.—Tropical Africa and Asia.
The form seen in cultivation was in each case the very large form that is propagated by cuttings and not by seed; the feral state was the white-flowered Ban Poi, probably not truly wild, but only feral by reversion, in our area.

LII.—ARISTOLOCHIACEÆ.

152. Aristolochia Linn.

201. **Aristolochia indica** Linn.; F. I. iii. 489; F. B. I. v. 75. E. D. A 1398.

Sea-face at Tiger Point, prostrate on the sand, *Heinig*!

Vernac. *Isharmal.*

A prostrate or climbing under-shrub; used in native medicine; also (*Heinig*) a sand-binding plant.
DISTRIB.—Throughout India and in Chittagong.

LII.—LAURINEÆ.

153. Cassytha Linn.

202. **Cassytha filiformis** Linn.; F. I. ii. 314; F. B. I. v. 188. E. D. C 805.

Sea-face, parasitic, *Heinig*!

Vernac. *Akas-bél.*

A parasitic leafless twiner; reputed medicinal.
DISTRIB.—Cosmopolitan in the Tropics.

LIII.—LORANTHACEÆ.

154. Loranthus Linn.

Flowers with scale-like bracts but without bracteoles:—

Leaves beneath covered with a rusty or whitish scurfy tomentum; corolla-tube 4-cleft . . . . . *Scurrula.*

Leaves beneath glabrous; corolla-tube shortly 5-fid *longiflorus.*

Flowers with both bracts and bracteoles, the latter connate in a cup; leaves glabrous, corolla tube 6-angled or rarely 5-angled below, and usually 6-partite, rarely 5-partite above . *globosus.*

203. **Loranthus Scurrula** Linn.; F. I. i. 550; ii. 186; F. B. I. v. 208; var. **bengalensis.**

General, especially on Gengwa (*Excœcaria Agallocha*).

Vernac. *Banda; Pargátcha.*

A leafy parasite; properties unimportant.

DISTRIB. (of this variety)—Assam; East Bengal.

204. **Loranthus longiflorus** Desr.; F. B. I. v. 214. *L. bicolor* F. I i. 548; ii. 185. E. D. L 549.

General, and on many species.

Vernac. *Bara Manda; Banda; Pargátcha.*

A leafy parasite; properties unimportant.

DISTRIB.—Throughout India.

205. **Loranthus globosus** Roxb.; F. I. i. 550; ii. 187; F. B. I. v. 220.

Occasional, and only seen on *Keora* (*Sonneratia apetala*).

Vernac. *Chhota Manda; Banda; Pargátcha.*

A leafy parasite; properties unimportant.

DISTRIB.—India generally; W. Indo-China; Malaya.

155. Viscum Linn.

206. **Viscum monoicum** Roxb.; F. I. iii. 763; F. B. I. v. 224. E. D. V 154.

Occasional; Bringoalni, *Heinig & Gammie*! Suta Khal, *Prain*!

Vernac. *Banda; Pargátcha.*

A leafy parasite; properties unimportant.

DISTRIB.—India; Indo-China.

LIV.—EUPHORBIACEÆ.

156. Euphorbia Linn.

Glands of the involucre with a distinct membranous, petaloid limb *hypericifolia* var. *indica.*

Glands of the involucre narrowly winged or wingless:—

Erect or ascending herbs; leaves distinctly nerved and copiously hispid with crisped hairs; leaves rarely less than three-quarters of an inch long . . . . . *pilulifera.*

Prostrate herbs; leaves very indistinctly nerved and sparingly hispid; leaves never more than one-third of an inch long *thymifolia.*

207. **Euphorbia hypericifolia** Linn. VAR. **indica** F. B. I. v. 512. *E. uniflora* F. I. ii. 473. E. D. E 512.

Northern clearings, rare, *Prain* !

A weed ; properties unimportant.
DISTRIB.—Tropical Asia and Africa.

208. **Euphorbia pilulifera** Linn. ; F. B. I. v. 250. *E. hirta* F. I. ii. 472. E. D. E 531.
Northern clearings, *Calcutta Garden Collectors* !
Vernac. *Bara Kerui.*

A weed of waste places ; properties unimportant.
DISTRIB.—Cosmopolitan in tropical and sub-tropical regions.

209. **Euphorbia thymifolia** Burm. ; F. I. ii. 473 ; F. B. I. v. 252. E. D. E 549.
Northern clearings, rare, *Prain* !
Vernac. *Çveta Kerui.*

A prostrate field-weed ; properties strongly purgative.
DISTRIB.—Tropics everywhere, except in N. Australia.

157. Bridelia Willd.

210. **Bridelia stipularis** Bl. ; F. B. I. v. 270. *B. scandens*, F. I. iii. 736. E. D. B 873.
Northern forests, *Calcutta Garden Collectors* !
Vernac. *Harinhárá.*

A large subscandent evergreen shrub ; wood hard, brown, used as fuel.
DISTRIB.—Trop. Africa ; S.-E Asia.

158. Agyneia Vent.

211. **Agyneia bacciformis** A. Juss. ; F. B. I. v. 285. *Phyllanthus bacciformis* F. I. iii. 661.
Clearings, and open muddy places in northern and western parts ; common.

A sub-littoral herb or under-shrub ; properties unimportant.
DISTRIB.—Mauritius ; Coromandel Coast ; Ceylon ; Java.

159. Phyllanthus Linn.

212. **Phyllanthus Niruri** Linn ; F. I. iii. 659 ; F. B. I. v. 298. E. D. P 657.
Northern clearings, very plentiful.
Vernac. *Bhui Amla.*

A field weed ; properties medicinal—used externally for skin-affections, internally as a febrifuge.
DISTRIB. Tropics everywhere, except in N. Australia.

160. Breynia Forst.

213. **Breynia rhamnoides** Muell-Arg.; F. B. I. v. 330. *Phyllanthus Vitis-Idæa* F. I. iii. 665. E. D. B 858.

Reserved forests, *Heinig*! Jatta, among ruins, *Prain*!
Vernac. *Kali Siki.*

A shrub or small tree; an unimportant weed.
DISTRIB.—S.-E. Asia.

161. Cyclostemon Bl.

214. **Cyclostemon assamicus** Hook. f.; F. B. I. v. 342.
Reserved forests, *Heinig*! *Heinig & Gammie*!
Vernac. *Ban Bokal.*

A tree, 30 feet high; wood brown, hard, used for planking.
DISTRIB.—Himalaya; Indo-China.

162. Antidesma Linn.

215. **Antidesma Ghaesembilla** Gærtn.; F. B. I. v. 357. *A. paniculatum* F. I. iii. 770. *A. pubescens* F. I. iii. 770. E. D. A 1219.
Jatta, among ruins, *Prain*!
Vernac. *Khúdi Jamb; Timtóa.*

A small tree; leaves and fruit eaten; wood used as fuel.
DISTRIB.—Tropics of the Eastern Hemisphere.

163. Croton Linn.

216. **Croton oblongifolius** Roxb.; F. I. iii. 685; F. B. I. v. 386. E. D. C 2180.

Northern forests, *Heinig*!
Vernac. *Chucka; Uri-ám* (*fide Heinig*).

A small deciduous tree; wood whitish-yellow, fairly hard and heavy but liable to crack, used as fuel; seeds yield a purgative oil.
DISTRIB.—India; Indo-China.
This tree is often used as a fence, whence possibly its occurrence in our area is to be explained.

164. Chrozophora Neck.

217. **Chrozophora plicata** A. Juss; F. B. I. v. 409. *Croton plicatus* F. I. iii. 681. E. D. C 2211.

Northern clearings, *Prain*!
Vernac. *Khúdi Okra.*

An annual but sometimes shrubby weed; leaves yield a dye; seeds purgative; liber yields a fibre; whole plant used as fuel.
DISTRIB.—India; Orient; S. Europe; N. Africa.

165. Acalypha Linn.

218. **Acalypha indica** Linn.; F. I. iii. 675; F. B. I. v. 416. E. D. A 306.

Jatta, among ruins, *Prain*!

Vernac. *Khokli.*

An annual weed; whole plant medicinal—expectorant or emetic according to dose.

Distrib.—Tropics of Eastern Hemisphere.

166. Trewia Linn.

219. **Trewia nudiflora** Linn.; F. I. iii. 837; F. B. I. v. 423. E. D. F 525.

Sea-face, *Heinig*! Northern clearings, not planted.

Vernac. *Pitáli.*

A large tree; wood soft, not durable, used in making native drums; pulp of fruit sometimes eaten.

Distrib.—S.-E. Asia.

167. Mallotus Lour.

220. **Mallotus repandus** Muell-Arg.; F. B. I. v. 442. *Rottlera dicocca* F. I. iii. 829.

Northern parts, *Calcutta Garden Collectors*!

Vernac. *Nuna Bhanturi*; *Akús.*

An erect or climbing shrub; wood yellowish-white, hard, used as fuel.

Distrib.—S.-E. Asia; New Caledonia.

Heinig cites the first vernacular name here given as connoting *Croton caudatus*, which it apparently does in the Gangetic Plain. So far, however, specimens of *Croton caudatus* have not been sent from the Sundribuns to the Calcutta Herbarium, while the name is given by our collectors along with specimens of *Mallotus repandus.* The two plants are not unlike each other and the use of the same name for both is not surprising. *Croton caudatus* should be looked for.

168. Sapium P. Br.

221. **Sapium indicum** Willd.; F. I. iii. 692; F. B. I. v. 471. E. D. S 833.

General, *Roxburgh, T. Thomson*! *Clarke*! *Heinig*! *Prain*!

Vernac. *Batul.*

A tree, 20 feet high; wood light-brown, soft, used as fuel; seeds used by fishermen to poison water.

Distrib.—Southward to Tenasserim.

169. Excœcaria Linn.

222. **Excœcaria Agallocha** Linn.; F. I. iii. 756; F. B. I. v. 472 E. D. E 593

Extremely plentiful everywhere, from the northern clearings to the sea-face.

Vernac. *Gengwa; Geria; Gheria; Geo.*

A tree, 30-50 feet high; wood white, soft, chiefly used as fuel, but also for making jhools, dabbas, posts, planks, native drums and toys: charcoal also is made from it and an oil is extracted. The juices of this tree, which is the commonest of all the Sundribun species, are poisonous.

DISTRIB.—Coasts of S.-E. Asia; N. Australia; and Polynesia.

The breathing organs developed in connection with the roots of *Gengwa* do not assume the form of vertical blind root-suckers like those of *Amoora*, *Avicennia*, *Sonneratia*, etc., but consist of horizontal thickened segments, richly furnished with lenticels, that protrude through the mud, exactly as in *Carapa obovata*.

LV.—URTICACEÆ.

170. Trema Lour.

223. **Trema orientalis** Bl.; F. B. I. v. 484. *Celtis orientalis* F. I. ii. 65. E. D. T 522.

Jatta, among ruins, *Prain*!

Vernac. *Chikun.*

A large tree-weed; wood soft, used for making charcoal; liber yields a tolerable fibre.

DISTRIB.—S.-E. Asia.

171. Streblus Lour.

224. **Streblus asper** Lour.; F. B. I. v. 489. *Trophis aspera* F. I. iii. 761. E. D. S 2912.

Northern forests, *Calcutta Garden Collectors*!

Vernac. *Shiora.*

A shrub or small tree; wood white, moderately hard, close-grained, tough, elastic; used to make cart-wheels, and gives a good fuel; juice medicinal, and used instead of rennet; the twigs are used in cleaning teeth; the leaves are used to polish wood.

DISTRIB.—Everywhere throughout S.-E. Asia.

This is often used as a hedge-plant—a purpose which it serves admirably; possibly its presence in our area is due to this fact.

172. Ficus Linn.

Petiole rigid, never more than half-an-inch long, usually shorter; leaves ovate or rhomboid-elliptic . . . *retusa* var. *nitida.*

Petiole flexible, never less than an inch and a half long, usually longer :—

Leaves 3-nerved at base; petiole not exceeding two inches long . . . . . *infectoria.*

Leaves 5-7-nerved at base; petiole two and a half inches long or longer :—

Stipules large; petiole two and a half to three and a half inches long; leaf-blade with a cuspidate apex one-fifth the length of the blade proper . . . *Rumphii.*

Stipules minute; petiole three to four inches long; leaf-blade with a caudate apex half the length of the blade proper *religiosa.*

225. **Ficus retusa** Linn. VAR. **nitida** King; F. B. I. v. 541. *F. Benjamina* F. I. iii. 550.

Reserved Forests, *Heinig*! *Lace*!

Vernac. *Jir; Zir.*

A tree, 50 feet high; wood worthless.

DISTRIB.—S.-E. Asia; N. Caledonia.

226. **Ficus infectoria** Roxb.; F. I. iii. 550; F. B. I. v. 515. E. D. F 216.

Jatta, among ruins, *Prain*!

Vernac. *Pakúr.*

A low deciduous tree; wood worthless.

DISTRIB.—S.-E. Asia. In India it is often planted, as it possibly originally was here.

227. **Ficus Rumphii** Bl.; F. B. I. v. 512. *F. cordifolia* F. I. iii. 548. E. D. F 265.

Sea-face, *Heinig*! Jatta, among ruins, *Prain*!

Vernac *Ausat; Gaiasvattha.*

A large tree; wood worthless.

DISTRIB.—S.-E. Asia.

228. **Ficus religiosa** Linn.; F. I. iii. 547; F. B. I. v 513.

Jatta, growing on an old pagoda, *Prain*!

Vernac. *Asvattha; Ausat.*

A large tree; wood worthless. A sacred species, whence possibly its presence here.

DISTRIB.—Bengal generally to the foot of the Himalaya; C. India: elsewhere planted.

LVI.—CASUARINEÆ.

173. Casuarina Forst.

229. **Casuarina equisetifolia** Forst.; F. B. I. v. 569. *C. muricata* F. I. iii 519.

Banks of Jeodhara Khal, self-sown, *Lace*! *Prain*!
Vernac. *Bilati Jau.*

A tall handsome tree; wood brown, very hard and durable, but apt to crack; makes excellent fuel.

Distrib.—Shores of Indo-China; Malaya; Australia; Polynesia.

The presence of this species within our area as a wild tree, far from any planted examples, was first noticed by Mr. Lace. Probably the seeds which have given origin to these trees along the Jeodhara Khal, have been brought down by the stream from Morellganj, where an avenue of *Casuarinas* exists that was planted about 100 years ago.

LVII.—CERATOPHYLLEÆ.

174. Ceratophyllum Linn.

230. **Ceratophyllum demersum** Linn.; F. B. I. v. 639. *C. verticillatum* F. I. iii. 624.
Ponds and jhils in northern clearings.
Vernac. *Jhangi.*

A submerged aquatic; properties unimportant.
Distrib.—Cosmopolitan in the Tropics.

MONOCOTYLEDONES.

LVIII.—HYDROCHARIDEÆ.

175. Hydrilla Rich.

231. **Hydrilla verticillata** Casp.; F. B. I. v. 659. *Serpicula verticillata* F. I. iii. 578. *Vallisneria verticillata* F. I. iii. 751.
Ponds and jhils in northern clearings.
Vernac. *Jhangi; Kuréli.*

An aquatic weed; properties unimportant.
Distrib.—Tropical and sub-tropical regions of the Eastern Hemisphere and Australia.

176. Lagarosiphon Harv.

232. **Lagarosiphon Roxburghii** Benth.; F. B. I. iii. 659. *Vallisneria alternifolia* F. I. iii. 50.
Ponds and jhils in northern clearings.
Vernac. *Rasna-jhangi.*

An aquatic weed; properties unimportant.
Distrib.—S.-E. Asia.

177. Vallisneria Linn.

233. **Vallisneria spiralis** Linn.; F. B. I. iii. 660. *V. spiraloides* F. I. iii. 750. E. D. v 14.
Ponds and jhils in northern clearings.

Vernac. *Syála.*

An aquatic weed ; properties unimportant.

DISTRIB.—Cosmopolitan in tropical and sub-tropical regions.

178. Ottelia Linn.

234. **Ottelia alismoides** Pers. ; F. B. I. v. 662. *Damasonium indicum* F. I. ii. 216.

Ponds in northern clearings, rare, *Heinig*!

Vernac. *Parmi Kalla.*

An aquatic weed ; properties unimportant.

DISTRIB.—S.-E. Asia ; N. Australia.

LIX.—ORCHIDACEÆ.

179. Oberonia Lindl.

235. **Oberonia Gammiei** King & Pantling.

Eastern forests, *Heinig & Gammie* ! *Prain* ! *Lace* !

An epiphytic orchid ; properties insignificant.

180. Dendrobium Sw.

Leaves equitant, fleshy, distichous ; flowers small . . *anceps.*
Leaves not equitant, subcoriaceous ; flowers showy . *Pierardi.*

236. **Dendrobium anceps** Sw. ; F. I. iii. 487 ; F. B. I. v. 724.

Reserved Forests, *Roxburgh*, *Heinig & Gammie* ! *Lace* !

An epiphytic orchid ; of no economic value.

DISTRIB.—E. Himalaya ; Assam ; Tenasserim.

237. **Dendrobium Pierardi** Roxb. ; F. I. iii. 482 ; F. B. I. v. 738.

"Delta of the Ganges," *Roxburgh.*

A showy epiphytic orchid.

DISTRIB.—E. Himalaya ; Chittagong ; Tenasserim.

For this species the *locus classicus* is the Sundribuns, though it has not been collected there since Roxburgh's day ; it should be looked for.

181. Cirrhopetalum Lindl.

238. **Cirrhopetalum Roxburghii** Lindl. ; F. B. I. v. 774. *Ærides radiatum* F. I. iii. 476.

Eastern forests, *Carey, fide Roxburgh ; Prain* ! *Lace* !

An epiphytic orchid with small but handsome flowers.

182. Trias Lindl.

239. **Trias oblonga** Lindl. ; F. B. I. v. 780.

Eastern forests, *Heinig & Gammie* ! *Prain* ! *Lace* !

An epiphytic orchid ; of no economic importance.
DISTRIB.—Chittagong ; Tenasserim.

183. Luisia Gaud.

Stems rather stout ; sepals and petals pale yellowish-green ; epichile of lip rhomboid, subtruncate, hypochile saccate *teretifolia.*
Stems very slender ; sepals green outside, rose-purple inside, petals rose-purple with green base and tip ; epichile of lip wide-ovate, hypochile almost flat . . . . *brachystachys.*

240. **Luisia teretifolia** Gaud.; F. B. I. vi. 22. *Cymbidium triste* F. I. iii. 461.

General, but not plentiful, *Egerton, fide Roxburgh* (1809); *Heinig & Gammie ; Prain* !
Vernac. *Pargátcha.*

An epiphytic orchid ; of no economic value.
DISTRIB.—S.-E. Asia ; Melanesia.

241. **Luisia brachystachys** Bl. ; F. B. I. vi. 23.

Everywhere in the eastern and central forests, very common, *Heinig*! *Heinig & Gammie* ! *Prain* ! *Lace* !
Vernac. *Pargátcha.*

An epiphytic orchid ; of no economic value.
DISTRIB.—Himalaya ; Assam ; Tenasserim.

184. Saccolabium Bl.

Peduncle slender, long, laxly paniculately branched ; lip with a long cylindric spur . . . . . *ochraceum.*
Peduncle stout, short ; lip with a short conical spur :—
Peduncles shortly corymbosely branched . *longifolium.*
Peduncles simple, flowers in umbel-like corymbs *papillosum.*

242. **Saccolabium ochraceum** Lindl. ; F. B. I. vi. 62.

Eastern forests, rather common, *Heinig*! *Heinig & Gammie* ! *Prain*! *Lace* !
Vernac. *Pargátcha.*

An epiphytic orchid ; properties unimportant.
DISTRIB.—S. India ; Ceylon ; E. Himalaya ; Khasia ; Tenasserim.

243. **Saccolabium longifolium** Hook. f. ; F. B. I. vi. 62.

Eastern forests, at Supoti, *Heinig* !
Vernac. *Pargátcha.*

An epiphytic orchid ; properties unimportant.
DISTRIB.—E. Himalaya ; Assam ; Tenasserim.

244. **Saccolabium papillosum** Lindl ; F. B. I. vi 63. E. D. A 317.

Reserved forests, not uncommon, *Calcutta Garden Collectors*! *Heinig*! *Lace*!

Vernac. *Pargátcha ; ? Rasna.*

An epiphytic orchid ; properties unimportant.

Distrib.—Circars ; E. Himalaya ; Assam ; Tenasserim.

185. Sarcanthus Lindl.

Leaves elongate, filiform ; flowers in longish racemes *appendiculatus.*
Leaves oblong, short, amplexicaul ; flowers in short spikes *insectifer.*

245. **Sarcanthus appendiculatus** Hook. f. ; F. B. I. vi. 67.

Forests near sea-face, *Prain*! Eastern Forests, *Lace*!

Vernac. *Pargátcha.*

An epiphytic orchid ; properties unimportant.

Distrib.—Tenasserim : E. Himalaya.

246. **Sarcanthus insectifer** Reichb. f. ; F. B. I. vi. 68.

Reserved forests, everywhere, very common, *Heinig*! *Heinig & Gammie*! *Prain*! *Lace*!

Vernac. *Pargátcha.*

An epiphytic orchid ; of no economic value.

Distrib.—Bengal ; Behar ; Cachar ; Tenasserim.

This species is exceedingly plentiful throughout the Sundribuns and is the commonest orchid in these forests ; the next most common is *Luisia brachystachys*, which is almost as plentful. The third place, but a long way behind the other two, is taken by *Saccolabium ochraceum*. All the other species may be looked on as rare or uncommon.

186. Cleisostoma Hook. f.

247. **Cleisostoma ramosum** Hook. f. ; F. B. I. vi. 72.

Occasional in the reserved forests ; *Wallich ! Clarke ! Heinig & Gammie*!

Vernac. *Pargátcha.*

An epiphytic orchid ; of no economic value.

Distrib.—E. Himalaya ; Tenasserim.

LX.—SCITAMINEÆ.

187. Zingiber Adans.

248. **Zingiber Casumunar** Roxb. ; F. I. i. 49 ; F. B. I. vi. 248. E. D. z 199.

Jatta, among ruins, *Prain*!

Vernac. *Ban Ádá.*

A herb with perennial rootstock ; properties aromatic and stimulant.

Distrib.—Tropical Asia, usually cultivated : no doubt here the species was originally introduced.

188. Alpinia Linn.

249. **Alpinia Allughas** Roscoe; F. I. i. 61; F. B. I. vi. 253. E. D. A 849.

Northern river-banks, Dacopie, *Heinig* !

Vernac. *Hazi; Taruko.*

A large herb with perennial rootstock; properties aromatic.

DISTRIB.—India; Indo-China.

LXI.—AMARYLLIDACEÆ.

189. Crinum Linn.

250. **Crinum asiaticum** Linn.; F. B. I. vi. 280. *C. toxicarium* F. I. ii. 134. E. D. C 2062.

Plentiful on river-banks in the northern and central forests, sometimes occurring also in the interior of the islands, *Heinig* ! *Prain* !

Vernac. *Káchori.*

A large succulent herb; properties emetic.

DISTRIB.—Coasts of Ceylon: common elsewhere in India, but cultivated.

LXII.—DIOSCOREACEÆ.

190. Dioscorea Linn.

251. **Dioscorea pentaphylla** Linn.; F. I. iii. 806; F. B. I. vi. 289. E. D. D 522.

Jatta, among ruins, *Prain* !

Vernac. *Kanta-álu.*

A large climber with bulbiferous stems; root-tubers sometimes eaten.

DISTRIB.—Tropics of Eastern Hemisphere.

LXIII.—LILIACEÆ.

191. Asphodelus Linn.

252. **Asphodelus tenuifolius** Cav.; F. B. I. vi. 332. *A. clavatus* F. I. ii. 148. E. D. A 1579.

"Sundribuns," *Calcutta Garden Collectors* (1845) !

An annual weed; occasional only in fields in Lower Bengal and then usually only when the crop with which it is associated is raised from seed imported from Upper India; it has not been reported from the Sundribun clearings since 1845. In Upper India the seeds are used medicinally.

DISTRIB.—Africa; Upper India.

LXIV.—COMMELINACEÆ.

192. Commelina Linn.

253. **Commelina benghalensis** Linn.; F. B. I. vi. 370. E. D. c 1748.
Jatta, among ruins, *Prain*!
Vernac. *Kánchará.*

A weed; leaves sometimes used as a vegetable.
Distrib.—Tropics of Eastern Hemisphere.

193. Aneilema R. Br.

254. **Aneilema nudiflorum** R. Br.; F. B. I. vi. 378. *Commelina nudiflora* F. I. i. 173.
Sea-face, growing in sand, *Heinig*!

A slender weed; of no economic importance.
Distrib.—S.-E. Asia.
The presence of this species on the coast is probably due to its seeds having been brought from the Upper Gangetic plain by the great rivers.

LXV.—FLAGELLARIÆ.

194. Flagellaria Linn.

255. **Flagellaria indica** Linn.; F. I. ii. 154; F. B. I. vi. 391.
Northern forests, and margins of clearings; also sea-face at Tiger Point, *Heinig*! *Calcutta Garden Collectors*! *Prain*!
Vernac. *Ah Beti; Kuh Bent; Banchanda.*

A lofty, slender, glabrous, cane-like climber; the stems are used to make native pens.
Distrib.—Tropics of the Eastern Hemisphere, near the coasts.

LXVI.—PALMEÆ.

195. Nipa Wurmb.

256. **Nipa fruticans** Wurmb.; F. I. iii. 650; F. B. I. vi. 424. E. D. n 163.
Everywhere on banks of estuaries and tidal rivers, and in swampy localities in interior of reserved forests.
Vernac. *Gólpatta.*

A soboliferous palm with a very large rootstock; an excellent protection for muddy banks. The large grooved leaf-stalks are used as floats for sundri-logs; the young leaves are twisted into rough ropes; the full-grown leaves are cut and exported for thatch. The young fruit is edible; toddy is obtained from the spathe.
Distrib.—Ceylon; Indo-China; Malaya; N. Australia: in mangrove-swamps.

196. Areca Linn.

257. *Areca Catechu Linn.; F. I. iii. 615; F. B. I. vi. 405. E. D. A 1294.

Eastern Sundribuns, Backerganj Dist., cultivated.

Vernac. *Supári.*

A tall graceful palm with slender stem; yields the Betel-nut.

Distrib.—Cultivated, usually near the sea, throughout S.-E. Asia.

197. Phœnix Linn.

258. **Phœnix paludosa** Roxb.; F. I. iii. 789; F. B. I. vi. 427. E. D. P 582.

Everywhere on or near banks of tidal rivers.

Vernac. *Hantál; Hiṭál.*

A gregarious palm, usually about 12 feet high, rarely higher; stems used for the framework of walls of native houses and for the dunnage of roofs; leaves used in thatching; fruit eaten; the roots send up short blind vertical root-suckers.

Distrib.—All Indo-Chinese coasts.

The height given for this species in the F. B. I. is up to 25 feet, but the tallest examples in the Calcutta Garden (and these are taller than any seen in the Sundribuns) do not reach 20 feet. The diameter is given in the F. B. I. as 12-18 inches; the largest stem, out of many hundreds measured, has not been found to exceed $2\frac{1}{2}$ inches in diamater; local officers might make observations on these points.

Phœnix sylvestris *Linn.*, the Khajúr or wild date, is grown in the Bengal plain as a toddy palm just north of the Sundribun area, and possibly exists within the eastern Sundribuns (South Backerganj).

198. Calamus Linn.

259. **Calamus tenuis** Roxb.; F. I. iii. 780; F. B. I. vi. 447. E. D. C 114.

Northern forests, *Heinig*!

Vernac. *Sanchi Bent.*

A cane with long scandent stems; used for making the seats and backs of chairs, baskets, and the like.

Distrib.—Himalaya; Indo-China.

This is given in Heinig's list as *C. Rotang;* that species, however, is confined to S. India and Ceylon: Mr. Heinig's specimens are of *C. tenuis.*

199. Dæmonorops Bl.

260. **Dæmonorops Jenkinsianus** Mart.; F. B. I. vi. 462. E. D. C 90.

Northern forests, *T. Thomson*! *Heinig*!

Vernac. *Gola Bent.*

A stout scandent "rattan"; stems used for the same purposes as those of *Calamus tenuis.*

DISTRIB.—E. Himalaya; Assam; Chittagong.

This is given as *Calamus longipes* by Heinig, who mentions other "rattans" as associated with this and *C. tenuis*. No specimens of other species have been communicated, but, from Mr. Heinig's remark, it is probable that others do occur: they should be looked for.

200. Cocos Linn.

261. ***Cocos nucifera** Linn.; F. I. iii. 614; F. B. I. vi. 482. E. D. C 1520.

Eastern Sundribuns, S. Backerganj, cultivated.

Vernac. *Narikel*.

A tall unbranched palm; yields the coco-nut, also coir from the husk of the nut; the wood, known as Porcupine wood, is durable.

DISTRIB.—Cosmopolitan on tropical coasts.

Borassus flabellifer *Linn.*, the Tari Gách, a tall diœcious palm with fan-shaped leaves, is cultivated in the Bengal plain just north of the Sundribuns and may occur in the Eastern Sundribuns (S. Backerganj).

LXVII.—PANDANEÆ.

201. Pandanus Linn. f.

Carpels not united in groups; stamens free . . *fœtidus*.
Carpels united in groups; stamens connate . . *fascicularis*.

262. **Pandanus fœtidus** Roxb.; F. I. iii. 742; F. B. I. vi. 483.

Northern forests, *Heinig*.

Vernac. *Kotki Kánta*.

A shrubby screw-pine; properties insignificant.

DISTRIB.—Assam; Burma; Chittagong.

This is given in Heinig's list, but no specimens have been received; the record needs confirmation. This species is occasionally planted as a hedge and it may belong to the category of plants to which *Bouea*, *Cassia Fistula*, *Diospyros Embryopteris*, *Ægle*, *Cratæva*, etc., belong.

263. **Pandanus fascicularis** Lamk.; F. B. I. vi. 485. *P. odoratissimus* F. I. iii. 738. E. D. P 26.

Very general and often very abundant.

Vernac. *Kewa Kánta*.

A shrubby screw-pine, occasionally 10-15 feet high, usually much smaller. Leaves used for thatching; flowers eaten with pán; oil distilled and employed to mitigate the odour of castor oil.

DISTRIB.—India; Indo-China; Malaya; S. China; Polynesia.

LXVIII.—TYPHACEÆ.

202. Typha Linn.

Leaves usually more than an inch wide, trigonous above the sheath . *elephantina*.

Leaves usually less than an inch wide, semi-cylindric above the sheath
angustata.

264. **Typha elephantina** Roxb.; F. I. iii. 566; F. B. I. vi. 489. E. D. T 864 partly.

Northern parts, on river-banks along the outskirts of the reserved forests.

Vernac. *Hogla.*

A large bulrush; leaves used in thatching; the split reeds are woven into mats for covering boats and for making walls and partitions of houses.

DISTRIB.—India; Indo-China; N. Africa.

265. **Typha angustata** Chaub. & Bory; F. B. I. vi. 489. *T. angustifolia* F. I. iii. 567. E. D. T 864 partly.

Northern parts, on banks of ponds and rivers.

Vernac. *Hogla.*

A large bulrush; used with and like the preceding.

DISTRIB.—S. Europe; N. Africa; N. Asia; India; Indo-China.

This is the commoner of the two bulrushes in Lower Bengal, to the north of the Sundribun area.

LXIX.—AROIDEÆ.

203. Cryptocoryne Fisch.

266. **Cryptocoryne ciliata** Fisch.; F. B. I. vi. 492. *Ambrosinia ciliata* F. I. iii 491.

Small creeks in northern clearings, on fringe of northern forests, very abundant. *Prain!*

A stoloniferous aquatic with linear-lanceolate leaves, growing in mud and submerged at high-tides; properties unimportant.

DISTRIB—C. Bengal; Malaya.

204. Pistia Linn.

267. **Pistia Stratiotes** Linn.; F. I. iii. 131.; F. B. I. vi. 497. E. D. P 874.

Tanks and jhils, northern clearings, *Heinig! Prain!*

Vernac. *Táká-páná.*

A floating aquatic; an infusion of the leaves, also the soluble part of the ashes of the incinerated plant, used medicinally.

DISTRIB.—Cosmopolitan in the Tropics.

LXX.—NAIADACEÆ.

205. Ruppia Linn.

268. **Ruppia rostellata** Koch; F. B. I. vi. 568.

Northern parts, in ponds and jhils, very common.

Vernac. *Jhángi.*

A submerged aquatic; properties unimportant.
DISTRIB —Europe; Temp. and Trop. Asia.

206. Naias Linn.

269. **Naias minor** All.; F. B. I. vi. 569. *N. dichotoma* F. I. iii. 749.
Pond at Jeodhara, *Prain*!
Vernac. *Jhángi.*

A submerged aquatic; properties unimportant.
DISTRIB.—General in the Eastern Hemisphere.

LXXXI.—CYPERACEÆ.

207. Kyllinga Rottb.

270. **Kyllinga triceps** Rottb.; F. I. i. 181; F. B. I. vi. 587.
Jatta, among ruins, *Prain*!
Vernac. *Nirbishi.*

A small sedge; properties unimportant.
DISTRIB.—Africa; S.-E. Asia; Australia.

208. Pycreus Beauv.

271. **Pycreus polystachyus** Beauv.; F. B. I. vi. 392. *Cyperus polystachyus* F. I. i 193.
In all the northern cleared or partially cleared spaces, plentiful; also at the sea-face among sand, *Heinig*! *Prain*!
Vernac. *Jangli Modhi.*

A small glabrous sedge; properties unimportant, except that it is a sand-binding species.
DISTRIB.—Cosmopolitan on or near tropical and sub-tropical sea-shores.

209. Cyperus Linn.

Fruit, a plano-convex nut, with a flat face next the rachilla; umbels compound; leaves and bracts long . . . *inundatus.*
Fruit, an equilaterally trigonous nut:—
Stoloniferous sedges:—
Stolons long, hardening at length into woody rootstocks; leaves short or 0; stems stout:—
Leaves very few, 2-3 in. (rarely as much as 6 in.) long; rachilla with a very narrow wing; glumes when dry with their margins crisply incurved all round *malaccensis.*
Leaves hardly any; rachilla distinctly winged; glumes when dry with their margins recurved *tegetiformis.*
Stolons short, slender, with very slender stems *scariosus.*

Stolons 0 ; leaves and bracts long ; rachilla distinctly winged . . . . *exaltatus* var. *dives*.

272. **Cyperus inundatus** Roxb.; F. I. i. 301. *Juncellus inundatus* F. B. I. vi. 595. E. D. C 2601.

River-banks, not uncommon.

Vernac. *Pati.*

273. **Cyperus malaccensis** Lamk.; F. B. I. vi. 608. *C. Pangorei* F. I. i. 202. E. D. C 2609.

Banks of Cheila Bogi river, *Heinig & Gammie*!

Vernac. *Chumati Pati.*

A large glabrous sedge; useful for binding and protecting muddy river-banks.

DISTRIB.—S.-E Asia; Australia; Polynesia.

A stout sedge ; an excellent mud-binding species.

DISTRIB.—Silhet ; E. Bengal ; C. Bengal.

274. **Cyperus tegetiformis** Roxb.; F. B. I. vi. 612. *C. nudus* F. I. i. 209.

Sea-face at Tiger Point, *Heinig*!

Vernac. *Halaizu ; Goola-methi.*

A large glabrous sedge; properties unimportant.

DISTRIB.—India; Indo-China ; China ; Japan.

This sedge is plentiful in swampy places in C. Bengal, but has not hitherto been reported from the coasts of India ; doubtless its seeds have been washed down by the great rivers and cast up at Tiger Point.

275. **Cyperus scariosus** R. Br.; F. B. I. vi. 612. *C. pertenuis* F. I. i. 198. E. D. C 2617 partly only.

Northern settlements and partial clearings, plentiful, *Clarke*!

Vernac. *Nagar Modhi.*

DISTRIB.—Indo-China ; Australia.

Very like the preceding species but more slender in all its parts; in India this plant is confined to the northern Sundribuns and the immediately adjacent portion of Lower Bengal.

276. **Cyperus exaltatus** Retz VAR. **dives** Clarke ; F. B. I. vi. 617. C. *umbellatus* F. I. i. 205.

Northern clearings, in ponds and jhils, *Kurz*! *Calcutta Garden Collectors*! *Clarke*!

A tall sedge ; used for making matting.

DISTRIB.—Northern India.

210. Mariscus Vahl.

277. **Mariscus albescens** Gaud.; F. B. I. vi. 623.

Chandpie, *Prain!* Sea-face, very abundant, *Heinig*! *Prain*!

Vernac. *Halaiya.*

A large greyish sedge; one of the most useful of sand-binding species.
DISTRIB.—Tropical shores from Africa to Polynesia.

211. Eleocharis R. Br.

278. **Eleocharis spiralis** R. Br.; F. B. I. vi. 627. *Scirpus spiralis* F. I. i. 212.

In shallow standing water, near coast, *Heinig*!
Vernac. *Halaiya.*

A slender pipe-sedge; properties unimportant.
DISTRIB.—India; Indo-China.

212. Fimbristylis Vahl.

Lower glumes of the spikelets in a continuous spiral:—
Spikelets never more than half an inch long, usually considerably shorter:—
Spikelets in an umbel of usually 5-10, sometimes up to 20, very rarely 3, 2 or 1; glumes puberulous *ferruginea.*
Spikelets usually solitary, very rarely 2 or 3; glumes glabrous . . . *polytrichoides* var. *halophila.*
Spikelets always three-quarters of an inch to an inch long, solitary or 2-3, rarely 4-6 . . . *sub-bispicata.*
Lower glumes of the spikelets distichously imbricate *monostachya.*

279. **Fimbristylis ferruginea** Vahl; F. B. I. vi. 638. *Scirpus globulosus* F. I. i. 227.

Very common, both in the northern clearings and at the sea-face.

A tufted sedge; sand-binding, otherwise with properties unimportant.
DISTRIB.—Cosmopolitan in tropical and sub-tropical countries.

280. **Fymbristylis polytrichoides** Vahl VAR. **halophila** Kurz; F. B. I. vi. 632.

Canning Town, *Kurz*! *Calcutta Garden Collectors*! Jatta, Chandpie, Jeodhara, etc., *Prain*!

A sub-littoral sedge, known only (this variety) from the Sundribuns and Madras.

281. **Fimbristylis sub-bispicata** Nees & Meyen; F. B. I. vi. 634.

Sundribun sea-face, *Heinig*!

A littoral sedge; sand-binding; known in India only from the Sundribun coast and from Orissa; common on the coasts of China and Japan.

282. **Fimbristylis monostachya** Hassk.; F. B. I. vi. 649. *Scirpus schœnoides* F. I. i., 221.

Jatta, *Prain*!

A small glabrous sedge, common in the Gangetic plain.
DISTRIB.—Cosmopolitan in the Tropics.

213. Scirpus Linn.

Spikelets very many, in large decompound corymbs with several very large flat divaricate leafy bracts . . . . . *grossus.*
Spikelets few ; lowest bract alone manifest and resembling a continuation of the stem :—
Stems more or less 3-cornered at least in the upper portion and not transversely septate ; flowers with hypogynous bristles ; spikelets pedicelled :—
Hypogynous bristles plumose with spreading hairs *littoralis.*
Hypogynous bristles scabrid but not plumose *triqueter* var. *segregata.*
Stems terete throughout, transversely septate ; flowers without hypogynous bristles ; spikelets clustered in a dense lateral head . . . . . *articulatus.*

283. **Scirpus grossus** Linn. f. ; F. I. i. 231 ; F. B. I. vi. 659.
Northern and eastern parts, in still water.
Vernac. *Kasúru.*

A large sedge ; properties unimportant.
DISTRIB.—S.-E. Asia.

284. **Scirpus littoralis** Schrad. ; F. B. I. vi. 659. *S. pectinatus* F. I. i. 218.
Northern parts, *Kurz* ! *Calcutta Garden Collectors* !

An aquatic sedge ; properties unimportant.
DISTRIB.—Europe ; Africa ; Orient ; India ; Australia.

285. **Scirpus triqueter** Linn. VAR. **segregata** Clarke ; F. B. I. vi. 658.
Northern clearings, *Clarke* !

A sedge of muddy places ; properties unimportant.
DISTRIB.—Northward into the Bengal Plain ; New Guinea.

286. **Scirpus articulatus** Linn. ; F. I. i. 214 ; F. B. I. vi. 656.
Northern parts, rare, *Heinig* !

An aquatic sedge of wet places ; properties unimportant.
DISTRIB.—Africa ; S.-E. Asia ; Australia.

214. Cladium P. Br.

287. **Cladium riparium** Benth. VAR. **crassa** Clarke ; F. B. I. vi. 675.
Eastern Sundribuns, plentiful, *Clarke !*

A very large sedge, about 6 feet high.
DISTRIB.—Ceylon.

This has only been obtained by Clarke and only to the east of the Madumati, but it is, where it occurs, abundant. It might be looked for in the area between the Hughli and the Madumati.

215. Scirpodendron Zipp.

288. **Scirpodendron costatum** Kurz ; F. B. I. vi. 684.

Reserved forests, south of Suta Khal, growing with *Pandanus* in the swampy interior, *Prain* !

A stout sedge with large woody nuts enclosed in a succulent, edible epicarp.
DISTRIB.—Ceylon ; Malaya ; Australia ; Samoa.

LXXII.—GRAMINEÆ.

216. Paspalum Linn.

Stems decumbent at base ; leaves rather broad ; spikelets orbicular *scrobiculatum.*

Stems creeping and rooting ; leaves narrow ; spikelets ovate-oblong *distichum.*

289. **Paspalum scrobiculatum** Linn. ; F. I. i. 278 ; F. B. I. vii. 10. *P. Kora* F. I. i. 279. E. D. P 332.

Jatta, *Prain* ! Canning Town, *Calcutta Garden Collectors* !

Vernac. *Kodo-dhan.*

A fodder grass.
DISTRIB.—Cosmopolitan in the Tropics.

290. **Paspalum distichum** Linn. ; F. B. I. vii. 12. *P. longiflorum* F. I. i. 279.

Sundribuns, *Hooker & Thomson* ! at Kabutar, plentiful, *Prain* !

An indifferent fodder-grass ; valuable as a mud and sand-binding plant.
DISTRIB.—On all tropical coasts.

217. Eriochloa H. B. & K.

291. **Eriochloa polystachya** H. B. & K. ; F. B. I. vii. 20. *Milium ramosum* F. I. i. 316. E. D. E 287.

Northern clearings, very plentiful.

A quick-growing grass of wet places ; a tolerable fodder.
DISTRIB.—Cosmopolitan in the Tropics.

218. Panicum Linn.

Spikelets paniculate :—

Panicles open, with long slender branches :—

Leaves green, flat . . . . . *proliferum.*

Leaves glaucous, convolute . . . . *repens.*

Panicles compact, spiciform, with short adpressed branches *Myurus.*

Spikelets on the branches of a simple raceme :—

Raceme with subsecund at length spreading branches *prostratum.*

Racemes contracted or pyramidal :—

Spikelets not awned . . . . . *colonum.*

Spikelets awned . . . . . *Crus-Galli.*

292. **Panicum proliferum** Lamk.; F. B. I. vii. 50. *P. paludosum* F. I. i. 307.

Northern clearings, in ponds and jhils.

Vernac. *Boráti ; Kalas-nár.*

A matted floating grass; a poor fodder.

Distrib.—Cosmopolitan in the Tropics.

293. **Panicum repens** Linn.; F. B. I. vii. 49. *P. uliginosum* F. I. i. 308. E. D. p 75.

Northern parts, in wet places and on river-banks.

Vernac. *Barandá.*

A coarse grass and an indifferent fodder, but a very valuable mud-binding species.

Distrib.—Cosmopolitan in tropical and sub-tropical countries.

294. **Panicum Myurus** H. B. & K.; F. B. I. vii. 39. *P. serrulatum* F. I. i. 307.

Northern clearings, in ponds, *Heinig*!

A matted floating grass ; a poor fodder.

Distrib.—S.-E. Asia; N. Australia; Trop. America.

295. **Panicum prostratum** Lamk.; F. B. I. vii. 33. E. D. p 72.

Jatta, among ruins, *Prain* !

A small creeping grass ; an excellent fodder.

Distrib.—Cosmopolitan in the Tropics.

296. **Panicum colonum** Linn.; F. B. I. vii. 32. E. D. p 45.

Jatta, *Prain !*

Vernac. *Sháma.*

A slender grass ; an excellent fodder.

Distrib.—Cosmopolitan in the Tropics.

297. **Panicum Crus-Galli** Linn.; F. B. I. vii. 30. *P. hispidulum* F. I. i. 303. E. D. p 48.

Northern clearings, rare, *Calcutta Garden Collectors* !

A rather coarse grass ; a good fodder when young.

Distrib.—Cosmopolitan in the Tropics.

219. Setaria Beauv.

Panicle spiciform, cylindric; bristles with erect or spreading barbs. *glauca.*

Panicle subpyramidal, the lower involucels in segregate clusters; bristles with reversed barbs . . . . *verticillata.*

298. **Setaria glauca** Beauv.; F. B. I. vii. 79. *Panicum glaucum* F. I. i. 285. E. D. P 1207.

Jatta, *Prain*!

Vernac. *Pingi Natchi.*

An erect annual grass; a moderately good fodder.

Distrib.—Cosmopolitan in tropical and sub-tropical regions.

299. **Setaria verticillata** Beauv.; F. B. I. vii. 80. *Panicum verticillatum* F. I. i. 301. E. D. P 1223.

Northern clearings, rare, *Calcutta Garden Collectors*!

Vernac. *Dora-biyára.*

A rank grass; a tolerable fodder when young.

Distrib.—Cosmopolitan in tropical and sub-tropical regions.

220. Chamæraphis R. Br.

300. **Chamæraphis spinescens** Poir.; F. B. I. vii. 62.

Northern clearings, in ponds and jhils, *Calcutta Garden Collectors*!

A matted floating grass; a poor fodder.

Distrib.—S.-E. Asia; Australia.

221. Oryza Linn.

Leaves herbaceous with unarmed margins, ligule long 2-partite; panicle lax; awn very long . . . . *sativa.*

Leaves coriaceous with spinulose margins, ligule very short; panicle spiciform; awn short, rigid . . . . . *coarctata.*

301. **Oryza sativa** Linn.; F. I. ii. 200; F. B. I. vii. 92. E. D. O 258.

Everywhere throughout the forests on the sloping alluvium of river-banks from the northern boundary to the sea-face, "wild, or as an escape from cultivation," *Heinig*!

Vernac. *Dhán.*

An annual grass; "of no economic value" (*Heinig*).

Distrib.—Tropical Australia.

Heinig's specimens, from various localities in the Sundribun forests, give more the suggestion of a condition 'feral after escape' than of a truly wild stock; they have stouter stems and fuller ears than undoubtedly wild plants collected in fresh-water marshes and jhils elsewhere by King and other Indian botanists. Though apparently as widely spread as the next species, *O. sativa* is rare, whereas the next is exceedingly abundant. All Heinig's specimens have very long awns.

302. **Oryza coarctata** Roxb.; F. I. ii. 206; F. B. I. vii. 93.

Everywhere in the forests on newly formed sloping alluvial river-banks, from the northern boundary to the sea-face, *Hamilton*, *Griffith*! *Ellis*! *Heinig*! *Prain*! Sea-face, on sand covered by high tides, *Prain*!

Vernac. *Bani Dhán.*

A tall, rigid perennial grass, with wiry rootstock; an excellent mud- and sand-binding plant.

Distrib.—Sind.

First discovered by Hamilton in 1796. This is the most common and most plentiful grass in the Sundribuns; it is the first species to establish itself on the compensation banks of alluvium that are formed on the opposite bank of a river whenever the 'set' of the current produces erosion. Such banks vary in size from a few square yards to several acres; wherever they occur there are closely and uniformly covered by a sheet of *Oryza coarctata*. Where the bank shelves rapidly off into deep water a narrow fringe of *Myriostachya Wightiana* is often associated with the *Oryza* at the river-edge; the upper or forest margin of such a bank becomes at times invaded by a belt of *Hargóza* (*Acanthus ilicifolius*) bushes, and by young plants of *Géngwa* (*Excœcaria Agallocha*), *Keora* (*Sonneratia apetala*), *Báen* (*Avicennia officinalis*) and the like. This belt of shrubbery gradually extinguishes the *Oryza coarctata*. If such a belt, as sometimes happens, does not form immediately, a sward of *Zoysia pungens*, mingled with tufts of *Fimbristylis ferruginea*, springs up instead on the landward side of the alluvial bank and drives the *Oryza* out. The plants of *O. coarctata* near the upper edge of such a bank rarely exceed 18 inches in height; towards the lower or river-edge they may be from 4 to 6 feet high. On the sand at the sea-face, the stems are only 4-8 inches high; they are, however, perfectly healthy and flower profusely though they are covered by every high tide. The species is one of the best sand-binders on the coast, as well as the most effective of the mud-binders on these newly formed alluvial banks.

222. Leersia Sw.

303. **Leersia hexandra** Sw.; F. B. I. vii. 94. *L. ciliata* F. I. ii. 207. E. D. L 247.

Northern clearings, in ponds, *Calcutta Garden Collectors*!

A floating grass; a good fodder.

Distrib.—Cosmopolitan in the Tropics.

223. Zoysia Willd.

304. **Zoysia pungens** Willd.; F. B. I. vii. 99. *Agrostis matrella* F. I. i. 317.

Northern clearings, very common; occasionally also in narrow patches behind alluvial river-banks throughout the forests; sea-face, common.

A wiry grass; useless as fodder; an excellent sand-binder.

DISTRIB.—Shores of Mascarene Islands; S.-E. Asia; Tropical Australia; Polynesia.

This the grass that is next most common in the Sundribuns after *Oryza coarctata*; it occurs in the northern clearings where *Oryza* is not found; frequently is associated with *Oryza* at the upper or landward edge of alluvial banks; and is plentiful along the sea-face just above tide-mark.

224. Imperata Cyrill.

305. **Imperata arundinacea** Cyrill.; F. B. I. vii. 196. *Saccharum cylindricum* F. I. i. 234. E. D. 151.

Northern clearings, general.

Vernac. *Ulu; Unu.*

A tough grass; extensively used for thatching.

DISTRIB.—Cosmopolitan in the Tropics.

225. Saccharum Linn.

306. **Saccharum spontaneum** Linn.; F. I. i. 235; F. B. I. vii. 118. E. D. s 49.

Sea-face, general on the small sand-heaps above tide-mark, in large tussocks, *Heinig*! *Prain*!

Vernac. *Khágra; Kashiya.*

A tall coarse grass; useful as a sand-binder; may also be used for thatching and for making rough ropes.

DISTRIB.—Tropical and sub-tropical parts of Eastern Hemisphere and Australia.

226. Andropogon Linn.

Scented, tall; glumes muricated . . . . *squarrosus.*

Inodorous; glumes not muricated:—

Tall; joints of rachis and pedicels of upper spikelets compressed, with thickened margins and a translucent centre *intermedius.*

Short; joints of rachis opaque; tips of branches of panicle bearded *aciculatus.*

307. **Andropogon squarrous** Linn. f.; F. B. I. vii. 186. *A. muricatus* F. I. i. 265. E. D. A 1007.

In large tussocks, on bunds, in northern clearings, *Calcutta Garden Collectors*! *Prain*!

Vernac. *Khas-Khas.*

A large perennial tufted grass; used elsewhere in India to make aromatic scented mats, fans, baskets and the like; root yields on distillation a fragrant oil.

DISTRIB.—Tropical Africa; India generally; Java. Possibly originally introduced to India by Arab navigators and invaders. The natural conditions are so suitable for this grass that there is no reason why it should not be wild in these northern clearings and, as a matter of fact, it is not actually cultivated.

But the tussocks are so scarce that it is perhaps more probable that the grass was originally introduced by man.

308. **Andropogon intermedius** R. Br.; F. B. I. vii. 175. *A. glaber* F. I. i. 267.

Northern and western clearings, on bunds.

Vernac. *Gandha Guráná.*

A tall grass, forming small tussocks; properties insignificant.

DISTRIB.—Tropical Africa; sub-tropical and tropical Asia; Polynesia.

309. **Andropogon aciculatus** Retz; F. I. i. 262; F. B. I. vii. 188. E. D. A 1073 and C 1053.

Northern clearings, common.

Vernac. *Chor Kanta.*

A small tufted coarse grass; a poor fodder even when young; cattle refuse it after its flowers appear.

DISTRIB.—Tropical Asia; N. Australia; Polynesia.

227. Sporobolus R. Br.

310. **Sporobolus tremulus** Kunth; F. B. I. vii. 250. *Agrostis tenacissima* F. I. i. 316.

Northern clearings, very abundant; occasional in grassy spots at forest-edge of mud-banks throughout the reserves; also at the sea-face.

A slender grass with much-matted stems (sometimes 18 in. to 2 ft. long, usually only 2-6 in. long), numerous from a hard knotted stoloniferous stock; the stolons 6-18 in. long, leafy. An indifferent fodder; a good mud-binding but less effective sand-binding species.

DISTRIB.—S.-E. Asia.

This is the third most abundant of the Sundribun grasses; in the clearings it is the only really abundant grass though even there it is always more or less accompanied by *Zoysia*, with which it is sparingly associated at the upper edge of alluvial banks and still more sparingly at the sea-face.

228. Chloris Sw.

311. **Chloris barbata** Sw.; F. I. i. 329; F. B. I. vii. 292. E. D. C 1026.

Northern clearings, at Kagdip, *Prain*! and elsewhere, *Heinig & Gammie*! *Calcutta Garden Collectors*!

A handsome tufted grass; an indifferent fodder when young; cattle do not eat it after it flowers.

DISTRIB. Cosmopolitan in the Tropics.

229. Eleusine Gærtn.

Spikelets closely imbricate, pointing forward, not awned . . . . *indica.*

Spikelets patent, at right angles to rachis of spike, the second glume abruptly shortly awned . . . . . *ægyptiaca.*

312. **Eleusine indica** Gærtn.; F. I. i. 345; F. B. I. vii. 293. E. D. E 186.

Northern clearings, rare, *Calcutta Garden Collectors*!

A small coarse tufted grass; an indifferent to fair fodder.

DISTRIB.—Tropics of the Eastern Hemisphere, but now introduced in tropical America.

313. **Eleusine ægyptiaca** Desf.; F. I. i. 344; F. B. I. vii. 295.

Kagdip, *Prain*!

A prostrate tufted grass; a good fodder.

DISTRIB.—Tropics of Eastern Hemisphere, but now introduced into tropical America.

This was only met with on a small patch of artificially raised ground where coal for the forest launches is kept, and is no doubt a quite recent introduction, along with coal, from Western Bengal.

230. Phragmites Trin.

314. **Phragmites Karka** Trin. VAR. **cincta** Hook f.; F. B. I. vii. 305. *Arundo Karka* F. I. i. 348. E. D. A 1539 and P 618.

Northern forests, *Heinig*! and clearings, *Kurz*! *Clarke*! *Heinig*! Vernac. *Nál.*

A tall, reed-like grass; the split stems are used to make *dharma* matting, also baskets employed in marketing; they are likewise used for the dunnage of boats, walling of pán-baris, and the like.

DISTRIB.—Tropical and sub-tropical regions of the Eastern Hemisphere and of Australia.

231. Eragrostis Beauv.

315. **Eragrostis tenella** R. & S. VAR. **plumosa** Stapf; F. B. I. vii. 315. *Poa plumosa* F. I. i. 337. E. D. E 263.

Northern clearings, occasional.

A slender annual grass; a good fodder.

DISTRIB.—India; Ceylon; Burma.

232. Myriostachya Hook f.

316. **Myriostachya Wightiana** Hook f.; F. B. I. vii. 327.

General in all parts of the forests, but rarely very abundant.

A tall stout perennial glabrous grass; properties much those of *Phragmites.*

DISTRIB.—Malay Peninsula.

This grass holds the fourth place in order of frequency in the true Sundribun forests, where it very usually is associated with *Oryza coarctata.* In cases where an alluvial newly formed bank slopes gently into deep water this is not, as a rule, seen;

wherever a mud-bank drops suddenly into deep water a line of *Myriostachya* marks the river-margin of the *Oryza*-field. The *Myriostachya*, however, very often occurs in localities where *Oryza* does not, and forms a fringe of reed-like grass close up to the true forest. Though generally distributed from the northern borders to the sea-face it appears nowhere to be very plentiful.

The species is doubtfully reported from S. India in the *Flora of British India*, but the only specimen of the grass from Wight's herbarium seen by the writer appears to have come from Mergui. The species has been also reported from Langkawi south of Tenasserim and has been collected by Mr. C. Curtis both in Penang and in Province Wellesley.

233. **Diplachne** Beauv.

317. **Diplachne fusca** Beauv.; F. B. I. vii. 329. *Poa procera* F. I. i. 332.

Sundribuns; *Calcutta Garden Collectors* (1845)!

A tall tufted grass.

DISTRIB.—Tropics of Eastern Hemisphere and Australia.

There is in the Calcutta Herbarium a Sundribun specimen of this grass, collected in 1845; it has not been reported since. It is a grass the occurrence of which in the northern clearings would not cause surprise; it should therefore be looked for, with a view to confirming this old record.

CRYPTOGAMIA.

LXXIII.—POLYPODIACEÆ.

234. **Adiantum** Linn.

318. **Adiantum lunulatum** Burm.; Synops. Fil. 114. *Pteris lunulata* F. I. iv. (758, Ed. C. B. C.). E. D. A 506.

Jatta, growing on ruins, *Prain*!

Vernac. *Kali-jhamp*.

A tufted wiry fern; properties unimportant.

DISTRIB.—Tropical and sub-tropical regions generally.

235. **Pteris** Linn.

319. **Pteris vittata** Roxb.; F. I. iv. (757, Ed. C. B. C.).

"Delta of the Ganges," *Roxburgh* (1795).

Of this fern, obtained from the Sundribuns, Roxburgh has left a coloured drawing which shows that it must be very nearly related to *P. longifolia* Linn. (*P. amplexicaulis* Roxb.).

Roxburgh, however, distinguishes the two very carefully as follows:—

P. vittata; stipes rising singly from a creeping stem, long and polished: pinnæ not enlarging into a stipe-clasping base, tapering to a very long fine point and (generally) fertile for only about two-thirds their length.

P. amplexicaulis (P. longifolia *Linn.*); stipes in tufts, and short; when old scabrous; when young, woolly: pinnæ with enlarged stipe-clasping bases, rather obtusely pointed and fertile almost to the very points.

The other characters may be theoretically assumed to be likely to break down in the case of so common and so wide-spread a fern as *P. longifolia*, but no writer on ferns has, so far, claimed that *P. longifolia* ever has an elongated, stout, creeping rootstock. It may be that those authors are right who maintain that Roxburgh's *P. vittata* is only a badly described *P. longifolia*; it is, however, difficult for those who have had to follow Roxburgh's work elsewhere and had occasion to test its excellence and accuracy to believe in this explanation. The care and precision of Roxburgh's diagnosis are against the assumption, and the native artist who made the figure could have had no particular object in drawing a creeping rootstock if such were not before him. In any case the theory that Roxburgh and his artist were alike in error cannot be admitted till the Sundribuns have once more been carefully searched for this fern.

236. Ceratopteris Brogn.

320. **Ceratopteris thalictroides** Brogn.; Synops. Fil. 174. *Pteris succulenta* F. I. iv. (759, Ed. C. B. C.).

Rampura, among standing water in a recent and imperfect clearing, growing in ditches behind bunds, *Heinig & Gammie*! *Prain*!

Vernac. *Jangli Jhau* (*fide* Roxburgh).

A tufted succulent fern; properties unimportant.

Distrib.—Cosmopolitan in the Tropics.

237. Asplenium Linn.

Veins free; fronds once pinnate . . . . . *falcatum.*
Veins copiously anastomosing; fronds usually twice pinnate . *esculentum.*

321. **Asplenium falcatum** Lamk.; Synops. Fil. 208.

Northern forests, *Clarke*. Eastern forests, at Supoti, on trees, *Heinig & Gammie*!

A tufted epiphytic fern; properties unimportant.

Distrib.—Tropical Africa; S.-E. Asia; Polynesia.

322. **Asplenium esculentum** Presl.; Synops. Fil 244. *A. bipinnatum* F. I. iv. (756, Ed. C. B. C.).

Northern clearings, rare; Barisal, *Clarke*!

A strong tufted fern; fronds sometimes used as a vegetable.

Distrib.—S.-E. Asia.

238. Nephrodium Rich.

323. **Nephrodium aridum** Hook. & Bak.; Synops. Fil. 291. *Polypodium semisagittatum* F. I. iv. (753, Ed. C. B. C.).

"Delta of the Ganges" *Roxburgh*; Sundribuns, *Clarke*.

A tufted fern; properties unimportant.
DISTRIB.—S.-E. Asia.

239. Polypodium Linn.

Fronds dimorphic, the barren ones like a sere oak-leaf, the fertile pinnatifid . . . . . *quercifolium*.
Fronds all similar:—
Fronds pinnate, drooping, often rooting at the tip *proliferum*.
Fronds simple:—
Fronds covered beneath with stellate tomentum *adnascens*.
Fronds glabrous . . . . . *irioides*.

324. **Polypodium quercifolium** Linn.; F. I. iv. (750, Ed. C. B. C.); Synops. Fil. 367.
Everywhere common, from the northern boundary to the sea-face.
Vernac. *Gurúr*.

An epiphytic fern with two kinds of fronds; reputed medicinal, used in chest complaints.
DISTRIB.—S.-E. Asia; N. Australia.

325. **Polypodium proliferum** Roxb.; F. I. iv. (752, Ed. C. B. C.) Synops. Fil. 315.
Northern clearings.
Vernac. *Depu*.

A terrestrial fern with creeping rhizome and drooping often rooting and proliferous flagelliform fronds; properties unimportant.
DISTRIB.—Tropical and sub-tropical Africa; S.-E. Asia; N. Australia; Polynesia.

326. **Polypodium adnascens** Sw.; Synops. Fil. 349. *P. pertusum* F. I. iv. (750, Ed. C. B. C.).
Everywhere from the northern boundary to the sea-face.

A creeping epiphytic fern; properties unimportant.
DISTRIB.—Tropical Africa; S.-E. Asia.

327. **Polypodium irioides** Lamk.; Synops. Fil. 360. *P. glabrum* F. I. iv. (750, Ed. C. B. C.).
Everywhere from the northern boundary to the sea-face.
Vernac. *Chitiya Bora*.

An epiphytic fern; properties unimportant.
DISTRIB.—Tropics of Eastern Hemisphere and Polynesia.

240. Vittaria Sm.

328 **Vittaria elongata** Sw.; Synops. Fil. 395. *Pteris angustifolia* F. I. iv (757, Ed. C. B. C.).

General, from the northern boundary to the sea-face.

An epiphytic fern ; properties unimportant.

DISTRIB.—Tropical and sub-tropical regions of the Eastern Hemisphere and Australia.

241. **Drymoglossum** Presl.

329. **Drymoglossum piloselloides** Presl; Synops. Fil. 398. *Pteris piloselloides* F. I. iv. (757, Ed. C. B. C.).

Occasional only, but generally distributed.

An epiphytic fern ; properties unimportant.

DISTRIB.—S.-E. Asia (in Ceylon but not in India except Himalaya and Bengal).

242. **Acrostichum** Linn.

Climbing on trees ; fertile and barren pinnæ on distinct fronds *palustre.*

Terrestrial ; fertile and barren pinnæ on the same frond *aureum.*

330. **Acrostichum palustre** Bedd. *A. scandens* Synops. Fil. 412. *Pteris scandens* F. I. iv. (758, Ed. C. B. C.).

General.

Vernac. *Dhekwa ; Dehia.*

A large scandent epiphytic fern ; of little economic importance ; the leaves are used as thatch.

DISTRIB.—S.-E. Asia ; N. Australia ; Polynesia.

331. **Acrostichum aureum** Linn. ; Synops. Fil. 423. *A. emarginatum* F. I. iv. (749, Ed. C. B. C.).

Northern clearings and northern forests, very plentiful.

Vernac. *Udoban.*

A rigid tufted fern ; growing in muddy places ; leaves used in thatching.

DISTRIB.—Cosmopolitan in the Tropics, especially near the sea.

LXXIV.—OPHIOGLOSSACEÆ.

243. **Helminthostachys** Kaulf.

332. **Helminthostachys zeylanica** Hook. & Bauer ; Synops. Fil. 447. *Osmuda zeylanica* F. I. iv. (748, Ed. C. B. C.).

Eastern Sundribuns in Barisal District, *Clarke*!

Vernac. *Ekbir.*

A fern with a large barren, twice palmately lobed segment, and a smaller fertile spicate segment.

DISTRIB.—Foot of Eastern Himalaya ; Lower Bengal ; Ceylon ; Malaya ; N. Australia.

LXXV.—LYCOPODIACEÆ.

244. Lycopodium Linn.

333. **Lycopodium Phlegmaria** Linn. F. I. iv. (746, Ed. C. B. C.).
Reserved forests, rare, *Heinig & Gammie*!

A pendulous epiphyte, stems dichotomously forked ; properties unimportant.
DISTRIB.—Tropics generally.

245. Psilotum Sw.

334. **Psilotum triquetrum** Sw.
Eastern Sundribuns in Barisal District, *Clarke*!

A wiry tufted herb, epiphytic on roots of *Cocos nucifera*.
DISTRIB.—Cosmopolitan in the Tropics.

VII.—NEGATIVE FEATURES OF THE SUNDRIBUN FLORA.

In the foregoing chapters our attention has been necessarily given exclusively to those species that are known to occur in the Sundribuns, because specimens from this territory actually exist in the Calcutta Herbarium, or because careful observers like Roxburgh, Clarke and Heinig have reported their presence in the region. Having regard, however, to the fact that, with some of these reported species, e.g. *Barringtonia speciosa*, reported by Heinig only, and *Ceriops Candolleana*, reported both by Clarke and by Heinig, though there is no inherent improbability in the record, there is nevertheless the possibility of some mistake in identification , it has seemed better merely to mention the fact of the record ; while a search for *all* recorded species has been urged, these quite doubtful ones have been excluded from the serial list.

This sketch of the Sundribun Flora would, however, fail to be complete without a brief reference to the general flora of which it forms an integral part, and without a list of the more salient members of this flora that have not hitherto been recorded from the Sundribuns, but that it is not impossible, where the nature of the species actually present in the Sundribuns is considered, may yet be found there. For while it is no doubt true that we probably now know all the common, and the majority of the wide-spread though rare Sundribun species, it must be recollected that the area occupied by these forests is so very extensive as to forbid its systematic exploration island by island, and that therefore in the future, as in the past, accident alone can lead to the collection of any species that is not only rare but local in

its occurrence, or of most species that, even if plentiful where they occur, are confined to restricted areas within the Sundribun region.

The nature of this Littoral Flora, of which the Sundribuns form one of the most important provinces, has been so fully and philosophically dealt with by Schimper, that little has been left for others to add to his statements and conclusions.* Schimper's deductions are largely based on his own observations in the Malay Archipelago, though he has also made use of the observations of others, and notably of Kurz,† as regards the shores of the Andamans and Burma. Besides Schimper's classical work, however, reference may be made to two papers by the writer, wherein will be found an account of the corresponding flora in two non-Malayan localities that have not been dealt with either by Schimper or by Kurz; the shores of the Coco group at the north end of the Andamans,‡ and the Laccadive Archipelago.§ That some of the littoral species characteristic of the Strand-flora which occupies all the coasts from the Mascarenes to Melanesia will never be found in the Sundribuns is quite probable. Some of the characteristic species appear to be exclusively confined to rocky headlands or to shingle beaches, rarely if ever extending to sandy beaches and never appearing in tidal-swamps. For such species the Sundribun area affords no foothold. But for species that are to be found in tidal swamp-forests elsewhere in Malaya, Indo-China or India, the conditions that prevail in the Sundribuns are entirely suitable, and there is not a single Indo-Malayan swamp-forest species whose occurrence in our area would cause surprise. The limited extent of the sandy beaches along the Sundribun sea-face makes it conceivable that there is not sufficient accommodation for all the species that occur on sandy sea-shores elsewhere in the region occupied by this Strand-flora, but there is not in this fact a manifest reason why any particular species should be absent. Subjoined is therefore given a list of species, not hitherto reported from the Sundribuns, that are characteristic of other Indo-Malayan coasts and that therefore should be kept in mind as possible constituents of the Sundribun Flora. This list is in no sense exhaustive; it merely exhibits the names of striking and familiar species common on other shores of the Bay of Bengal.

---

* Schimper: *Die indo-malayische Strand flora*; Jena, 1891.

† Kurz: *Preliminary Report on the forest and other vegetation of Pegu*; Calcutta, 1875: also *Forest Flora of British Burma*; Calcutta, 1877.

‡ Prain: *Journal of the Asiatic Society of Bengal*, lx. 2, p. 283, *et seq.*; list of littoral species at p. 380.

§ Prain: *Botany of the Laccadives; Journal of the Bombay Natural History Society*, vol. vii (1892) and viii (1893).

List of littoral species found on Indian Coasts but not yet collected in the Sundribuns.

Guttiferæ.

Calophyllum inophyllum.

Sterculiaceæ.

Heritiera littoralis.

Simarubeæ.

Suriana maritima.

Rhamneæ.

Colubrina asiatica.

Leguminosæ.

Sophora tomentosa.

Combretaceæ.

Terminalia Catappa.
Lumnitzera coccinea.
Gyrocarpus Jacquini.

Lythraceæ.

Pemphis acidula.

Rubiaceæ.

Stephegyne diversifolia.
Guettarda speciosa.
Ixora brunnescens.
Hydrophylax maritima.

Compositæ.

Adenostemma viscosum.

Goodenovieæ.

Scævola Kœnigii.

Sapotaceæ.

Mimusops littoralis.

Apocyneæ.

Ochrosia borbonica.
Tabernæmontana crispa.

Borragineæ.

Cordia subcordata.
Tournefortia argentea.

Convolvulaceæ.

Ipomœa denticulata.
Operculina Turpethum.

Acanthaceæ.

Eranthemum succifolium.

Nyctagineæ.

Boerhaavia repens.
Pisonia aculeata.
Pisonia excelsa.
Pisonia alba.

Laurineæ.

Hernandia peltata.

Euphorbiaceæ.

Euphorbia Atoto.

Cycadaceæ.

Cycas Rumphii.

Liliaceæ.

Gloriosa superba.

Gramineæ.

Ischæmum muticum.
Thuarea sarmentosa.
Lepturus repens.
Spinifex squarrosus.

All of these species deserve therefore to be looked for by future explorers in the Sundribuns. The fact that the existing list of Sundribun plants includes such species as *Brownlowia lanceolata, Amoora cucullata, Carapa obovata, Kleinhovia hospita, Desmodium umbellatum, Erythrina indica, Dalbergia torta, Derris sinuata, Mucuna gigantea, Cæsalpinia Nuga, Cynometra mimosoides, Intsia bijuga, Barringtonia racemosa, Sonneratia acida, Petunga Roxburghii,*

Ægialitis rotundifolia, Launea pinnatifida, Azima tetracantha, Sarcolobus globosus, Ipomæa longiflora, Solanum trilobatum, Premna integrifolia, Clerodendron neriifolium, Avicennia alba, Salicornia brachiata, Arthrocnemum indicum, Agyneia bacciformis, Excoecaria Agallocha, Ficus Rumphii, Crinum asiaticum, Nipa fruticans, Mariscus albescens, Fimbristylis sub-bispicata, Cladium riparium, Scirpodendron costatum, Paspalum distichum, Oryza coarctata, Zoysia pungens, Myriostachya Wightiana, Acrostichum palustre, affords at once an ample proof of the suitability of the region for the great majority of the species to which attention is now directed, and a strong presumption that some at least of the plants given in that list will be found here associated with those enumerated in the census of known Sundribun species.

INDEX TO GENERA.

Abrus 298
Abutilon 288
Acacia 304
Acalypha 338
Acanthus 327
Acrostichum . . . 364
Adiantum 361
Ægialitis 316
Ægiceras 316
Ægle 292
Ageratum 314
Agyneia 336
Aldrovanda . . . 305
Allophylus 295
Alpinia 345
Alternanthera . . 333
Amarantus 332
Ammannia 309
Amoora 292
Andropogon . . . 358
Aneilema 346
Angelonia 325
Anisomeles . . . 332
Antidesma 337
Aphania 295
Areca 347
Aristolochia . . . 334
Arthrocnemum . . 333
Asphodelus . . . 345
Asplenium 362
Atylosia 300
Avicennia 330
Azima 317

Barringtonia . . . 308
Basella 334
Blumea 314
Bouea 296
Breynia 337
Bridelia 336
Brownlowia . . . 290
Bruguiera 307

Cæsalpinia . . . 301
Calamus 347
Calotropis 318
Canavalia 299
Capparis 287
Carapa 292
Cardiospermum . . 295
Cassia 302
Cassytha 334
Casuarina 340
Cephalandra . . . 311
Ceratophyllum . . 341
Ceratopteris . . . 362
Cerbera 317
Ceriops 306
Chamæraphis . . . 356
Chloris 359
Chrozophora . . . 337
Cirrhopetalum . . 342
Cladium 353
Cleisostoma . . . 344
Cleome 286
Clerodendron . . 329
Cnicus 315
Cocos 348
Coldenia 321
Commelina 346
Conyza 314
Corchorus 290
Cordia 321
Cratæva 286
Crinum 345
Crotalaria 296
Croton 337
Cryptocoryne . . . 349
Cucumis 311
Cuscuta 324
Cyclostemon . . . 337
Cynometra 303
Cyperus 350

Dæmia 319
Dæmonorops . . . 347
Dalbergia 300
Dendrobium . . . 342
Derris 301
Desmodium . . . 298
Dioscorea 345
Diospyros 316
Diplachne 361
Dischidia 320
Dolichandrone . . 326
Dregea 320
Drymoglossum . . 364

Eleocharis . . . 352
Eleusine 359
Entada 307
Eragrostis . . . 360
Eriochloa 354
Erythrina 298
Eugenia 307
Euphorbia 335
Excœcaria 339

Ficus 339
Fimbristylis . . . 352
Finlaysonia . . . 318
Flacourtia 287
Flagellaria . . . 346
Flemingia . . . 300

Glycosmis . . . 291
Grangea . . . 314
Gynandropsis . . 286

Heliotropium . . 322
Helminthostachys . 364
Hemidesmus . . 318
Hemigraphis . . 327
Heritiera . . . 289
Herpestis . . . 325
Hibiscus . . . 288
Hoppea . . . 320
Hoya 320
Hydrilla . . . 341
Hydrolea . . . 321
Hygrophila . . . 326

Imperata . . . 358
Intsia 303
Ipomœa . . . 322
Ixora 312

Kandelia . . . 306
Kleinhovia . . . 290
Kyllinga . . . 350

Lagarosiphon . . 341
Lantana . . . 328
Launea . . . 316
Leea 295
Leersia . . . 357
Leucas . . . 332
Limnanthemum . . 321
Limnophila . . . 325
Lippia . . . 328
Loranthus . . . 334
Luffa 310
Luisia . . . 343
Lumnitzera . . . 307
Lycopodium . . 365

Malachra . . . 288
Mallotus . . . 338
Mariscus . . . 351
Merremia . . . 322
Mezoneuron . . 302
Micromelum . . 291
Momordica . . . 310
Morinda . . . 313
Mucuna . . . 298
Myriostachya . . 360

Naias . . . 350
Naravelia . . . 285
Nephrodium . . 362
Nipa 346

Oberonia . . . 342
Ocimum . . . 331
Odina . . . 296
Olax 293
Oldenlandia . . 312
Oryza . . . 356
Ottelia . . . 342
Oxalis . . . 291
Oxystelma . . . 318

Pandanus . . . 348
Panicum . . . 354
Paramignya . . 291
Parkinsonia . . 302
Parsonsia . . . 318
Paspalum . . . 354
Passiflora . . . 310
Pentatropis . . . 319
Petunga . . . 312
Phaseolus . . . 299
Phœnix . . . 347
Phragmites . . 360
Phyllanthus . . 336
Pistia 349
Pluchea . . . 314
Polypodium . . 363
Pongamia . . . 300
Portulaca . . . 287
Premna . . . 329
Psidium . . . 308
Psilotrichum . . 333
Psilotum . . . 365
Pteris . . . 361
Pycreus . . . 350

Rhizophora . . 305
Ruppia . . . 349

Saccharum . . . 358
Saccolabium . . 343
Salacia . . . 293
Salicornia . . . 333
Sapium . . . 338
Sarcanthus . . . 344
Sarcolobus . . . 319
Scirpodendron . . 354
Scirpus . . . 353
Scoparia . . . 325
Senebiera . . . 286
Sesbania . . . 297
Sesuvium . . . 311
Setaria . . . 356
Solanum . . . 324
Sonneratia . . . 309
Sphaeranthus . . 315
Sporobolus . . . 359
Stictocardia . . 322
Streblus . . . 339
Suæda . . . 333

Tamarindus . . 303
Tamarix . . . 287
Teramnus . . . 298
Thespesia . . . 289
Tinospora . . . 286
Trema . . . 339
Trewia . . . 338
Trianthema . . 312
Trias 342
Trichosanthes . . 310
Turnera . . . 309
Tylophora . . . 320
Typha . . . 348

Utricularia . . 326

Vallisneria . . . 341
Vandellia . . . 325
Vangueria . . . 312
Vernonia . . . 313
Vigna . . . 299
Viscum . . . 335
Vitex 329
Vitis 294
Vittaria . . . 363

Wedelia . . . 315

Xanthium . . . 315

Zehneria . . . 311
Zingiber . . . 344
Zizyphus . . . 294
Zoysia . . . 357

G. I. C. P. O.—No. 3562 R. & A.—27-5-1903.—350.—W. S. DeR.

A CENSUS OF THE INDIAN POLYGONUMS.

By A. T. Gage.

BIBLIOGRAPHICAL SELECTION.

Aitchison: A catalogue of the plants of the Punjab and Sindh; On the Flora of the Kurram valley, Journal of the Linnean Soc., vol. xviii, p. 90. *Allioni*: Flora Pedemontana. *Anderson, J.*: Report on the expedition to Western Yunnan *viâ* Bhamo. *Babington*: A description of those species of Polygonums contained in the Herbarium of J. F. Royle, Trans. Linn. Soc., vol. xviii (1841), p. 93. *Bentham*: Flora Australiensis, vol. v. *Birdwood*: A catalogue of the Flora of Mahableshwar and Matheran, Journ. Bombay Nat. Hist. Soc., vol. ii, p. 107. *Boissier*: Flora Orientalis, vol. iv. *Bourne, A. G.*: List of the plants of Southern India. *Bruce & Smith*: Simla flowers. *Clarke, C. B.*: The sub-sub-areas of British India, Journ. Linn. Soc., vol. xxxiv. *Collett & Hemsley*: On a collection of plants from Upper Burma and the Shan States, Journ. Linn. Soc., Botany, vol. xxviii. *Dalzell & Gibson*: The Bombay Flora. *Don*: Prodromus Floræ Nepalensis. *Forbes & Hemsley*: An enumeration of all the plants known from China proper, etc., Journ. Linn. Soc., vol. xxvi, pp. 332 to 352. *Garcke & Klotsch*: Die botanischen Ergebnisse der Reise Prinzen Waldemar. *Giles*: Report on the collections of the Chitral-Kafiristan Mission. *Graham*: Catalogue of the plants of Bombay. *Griffith, Falconer, Helfer*: Kew distribution list of their plants. *Griesbach*: Flora of the British West Indian Islands; Symbolæ ad Floram Argentinam. *Hance*: Adversaria in stirpes Asiæ orientalis, Ann. des Sci. Nat., Ser. V, vol. v, 1866, pp. 237 to 239. *Hemsley*: The Flora of Tibet or High Asia, Journ. Linn. Soc., vol. xxxv, pp. 196 and 197. *Henry*: Kew distribution lists of his Chinese plants. *Hiern*: Catalogue of Welwitsch's African plants, part iv. *Hooker, J. D.*: Himalayan Journals; Flora of British India, vol. v. *Hooker, W. J.*: Niger Flora. *Hooker, J. D. & Thomson*: Flora Indica, vol. i. *Jaubert & Spach*: Illustrationes Plantarum Orientalium, vol. ii. *Meisner*: Polygonaceæ, DeCandolle's Prodromus, vol. xiv, pp. 82 to 142; Monographiæ generis Polygoni Prodromus; Synopsis Polygonearum in Wallich's Plantæ Asiaticæ rariores, vol. iii, p. 53; Polygonaceæ in Miquel's Ann. Mus. Lugd.-Bat., vol. ii, pp. 56 to 65; Polygonées, etc., de la haute Asie, Ann. des Sci. Nat., vol. vi, 1866, pp. 341 to 353. *Miquel*; Flora Indiæ Batavæ, vol. i, part i. *Mueller*, Baron *F. von*: A second census of Australian plants, part i, Vasculares. *Philippi*: Catalogus Plantarum Chilensium. *Records* of the Botanical Survey of India, vol. i and vol. ii, part i. *Rheede*: Hortus Malabaricus, vol. xii. *Roth*: Novæ plantarum species. *Roxburgh*: Flora Indica, vol. ii; Hortus Bengalensis. *Royle*: Illustrations of the Botany of the Himalayas. *Small*: A monograph of the North American species of the genus Polygonum. *Stewart*: Punjab plants, 1869. *Thomson*: Western Himalaya and Tibet. *Voigt*: Hortus suburbanus Calcuttensis. *Wight*: Icones plantarum, plates 1797 to 1808. *Woodrow*: The Flora of Western India, part vi; Journ. Bombay Nat. Hist. Soc., vol. xii, p. 365.

INTRODUCTION.

This paper is an expansion of notes made by the writer during an examination of the Indian Polygonums in the Calcutta Herbarium, undertaken at the request of Major Prain, Superintendent of the Royal Botanic Garden, Calcutta. The notes were originally put together under the idea of their being likely to be of use to workers in the Calcutta Herbarium. It has been thought, however, that they might prove of service to botanists in India generally, who may not have an opportunity of personally consulting the Calcutta Herbarium, and accordingly it has been decided to give them a wider publicity than a pigeon-hole in the Calcutta Herbarium Polygonum cabinet affords. The limits of the channel of publication have restricted the scope of the paper to little beyond a mere list of the species, with their localities, but so far as it goes, the paper gives as complete a distributional survey of the genus in India as the material in the Calcutta Herbarium permits.

The paper consists of three parts:—1st, a list of Indian species, inclusive of all those described in the Flora of British India, whether they are represented in the Calcutta Herbarium or not, with their localities and altitudes, whenever given ; 2nd, an artificial key to all the species and the more important varieties mentioned in the list; 3rd, a few notes on the distribution of the Indian species.

In the first part, localities, altitudes and ticket numbers have been quoted as fully as possible and for several reasons. Firstly, that those who may possess any unnamed or, at least according to this list, misidentified duplicates of the sheets quoted, may, if they choose, name or correct according to this list. Secondly, that if any worker finds occasion to differ from the writer as to the naming of any particular sheet or sheets, he or she may, with better opportunities than the writer—who, it is to be recollected, has had under study only the Calcutta Herbarium sheets and at the last moment a rapid survey of the Shaharanpur Herbarium sheets, consider and dispose of the question. Thirdly, that irrespective of names altogether, there may be as little doubt as possible, where there is access to a representative Herbarium, as to what are the plants to which the writer refers. Lastly, to make it possible to plot out, on blank maps of India, the distribution of any species with as great precision as the information supplied by collectors has made possible.

It is to be regretted that this information is not always by any means so complete as it might be. A fair percentage of the Calcutta sheets have not been quoted either because the tickets bear nothing beyond such

expression as "N. W. Him." or "Assam" or "Punjab", or "S. India", which for the purpose of a precise survey are much too vague, or because they give only the name of the hamlet near which the specimen had been picked up. This latter practice of collectors is, in the eyes of the compiler of a paper like the present, just as reprehensible as the former, as it leads to much needless expenditure of time—to mention nothing else—in attempting to identify such insufficiently indicated localities by consulting a multitude of maps, gazetteers, books of travel, etc., each of which probably has its own particular system of mis-spelling Indian place-names. Sheets bearing such expressions as "N. W. Himalaya", "Assam", are quoted only where they are the sole representatives of the species in the Calcutta Herbarium, or where properly localised specimens are very few.

The artificial key does not pretend to the unerring accuracy of an automatic machine, neatly naming and ejecting every Polygonum in whatever condition thrown into it, but it is hoped that it may aid the botanist unfamiliar with the Indian species to approximately place his specimens, so that he can compare them with the descriptions in the Flora of British India, with as little waste of time as possible. The tables of distribution explain themselves, and any additional notes merely have the merit, if it be such, of saving the reader a little mental and visual exercise.

The botanical area considered is practically the same as that dealt with in the Flora of British India. Ceylon, however, is here omitted, partly because that island has now a "Flora" of its own, partly because the Calcutta Herbarium has little beyond Thwaites' distribution numbers. The British Indian Empire, with Nepal, Sikkim, a small part of Tibet, Bhutan, the hills just to the east of Bhutan, and the Malay Peninsula, is taken as the unit. This being itself botanically a sub-area, is divided into sub-sub-areas, and these again into districts, as detailed below.

The sub-sub-areas are, in the main, similar to those adopted by Mr. C. B. Clarke in his paper on the sub-sub-areas of British India in the *Journal of the Linnean Society*, vol. xxxiv, but the writer's sub-sub-araes agree more with the political boundaries, which are more convenient for practical purposes, and probably will not be found to stand much in the way of drawing any phytogeographical inferences from the facts set forth. In the list of species, the distribution of each one is given in the order of the sub-sub-areas detailed below and within each sub-sub-area, where such sub-sub-areas are further sub-divided into districts, in the order of the districts. Each sub-sub-area, and within it each district, has its own number; but in every case the name as well as the number of the sub-sub-area or district is

given, to avoid repeated reference to the list of sub-sub-areas and districts.

Except in one or two cases a rigid definition of the boundaries of the sub-sub-areas or districts is not attempted, as in the majority of cases the names employed to denote them indicate their boundaries with sufficient clearness; any description in detail would be unintelligible without a good map of India and superfluous with one. The sub-sub-areas and districts recognised in this paper are as under: in drawing them up the introductory essay to Hooker and Thomson's Flora Indica has been used freely.

I.—North-West Frontier.

This sub-sub-area includes also the Punjab and Rajputana. The northern boundary is formed by the base of the North-West Himalaya; its eastern by the United Provinces of Agra and Oudh, and southern by the Nerbudda river; its western by the Arabian sea, Baluchistan, and Afghanistan.

Districts.—(1) The *Afghan border*. (2) *British Baluchistan*. (3) *Scinde*. (4) *Gujrat*, *Cutch*, and *Kathiawar*. (5) *Punjab, west of the Sutlej*. (6) *Punjab, east of the Sutlej*. (7) *Bhawalpur, Rajputana, and Indore*.

II.—Central Provinces.

Districts.—(1) *Central Provinces*. (2) *Berar*. (3) *Hyderabad*.

III.—Peninsular India.

This sub-sub-area includes all the peninsula south of the Nerbudda on the west and of Orissa on the east, exclusive of the preceding sub-sub-area.

Districts.—(1) The *Concan*. (2) *Canara*, *North* and *South*. (3) *Coorg*. (4) *Malabar* and the *Nilgiris*. (5) *Cochin* and *Travancore*. (6) The remainder of the *Bombay Presidency*. (7) The *Northern Circars*, from the southern boundary of Orissa to the Godavery River. (8) The *Carnatic*, from the Godavery to the Cauvery River. (9) The districts of *Coimbatore*, *Madura*, and *Tinnivelly*. (10) *Mysore*.

IV.—Upper Gangetic Plain.

Districts.—(1) *Agra* and *Oudh*. (2) *Bundelcund* and *Baghelcund*.

Agra and Oudh include the whole plain from the Punjab to Bengal.

V.—Bengal.

Districts.—(1) *Orissa.* (2) *Chutia Nagpur* including the *Sonthal Pergunnahs.* (3) *Tirhut*, or Bengal north of the Ganges and west of the Kosi River. (4) *Behar* or the district between the Ganges and Chutia Nagpur. (5) *North Bengal.*—Its boundaries are, north the base of the Himalayas; east the Brahmaputra; south the Ganges; west the Kosi. (6) *Central Bengal* and the *Sundribuns.*—Between the Brahmaputra, Hooghly, and Ganges rivers. (7) *West Bengal.*—Between the Hooghly and Chutia Nagpur. (8) *East Bengal.*—East of the Brahmaputra, but excluding Chittagong.

For the above divisions of Bengal the writer is indebted to Major Prain.

VI.—North-West Himalaya.

Districts.—(1) *Gilgit* and *Hunza.* (2) *Baltistan.* (3) *Nubra.* (4) *Dras.* (5) *Ladakh.* (6) *Zanskar.* (7) *Rupchu.* (8) *Spiti* and *Parang.* (9) *Chitral* and *Dir.* (10) *Swat Valley.* (11) *Hazara* and *Murree.* (12) *Kashmir.* (13) *Kistawar.* (14) *Lahul.* (15) *Kunawar* and *Bashahr.* (16) *Nowshera* (*Rajaori*). (17) *Jamu.* (18) *Chamba.* (19) *Kulu, Kangra, Mandi, Suket.* (20) *Simla.* (21) *Garhwal.* (22) *Kumaon.*

VII.—Nepal.

VIII.—Eastern Himalaya.

Districts.—(1) *Sikkim* including *Darjeeling.* (2) *Tibet* and *Bhutan.*

By *Tibet*, throughout this paper, is meant the small southward projecting bay between Sikkim and Bhutan, where Chumbi and Phari are situated.

IX.—Assam.

Districts.—(1) *Akha, Daphla* and *Miri Hills.* (2) *Mishmi Hills.* (3) *Garo Hills.* (4) *Khasia Hills.* (5) *Jaintia Hills.* (6) *Naga Hills.* (7) *Manipur.* (8) *Brahmaputra Valley.* (9) *Sylhet* and *Cachar.*

The Lushai hills, which politically are in Assam, are in this paper considered more appropriately with Burma.

X.—Burma.

Districts.—(1) *Chittagong Hill Tracts.* (2) *North* and *South Lushai Hills.* (3) *Chin Hills.* (4) *Arracan Yomah.* (5) *Kachin*

Hills. (6) *North* and *South Shan* and *Karen Hills.* (7) *Pegu*; *Yomah.* (8) *Chindwin Valley.* (9) *Arracan.* (10) *Irrawaddy Valley.* (11) *Sittang Valley.* (12) *Tenasserim.*

XI.—Malay Peninsula and Andamans.

Districts.—(1) The *Peninsula.* (2) The *Andamans* and *Nicobars.*

PART I.—LIST OF SPECIES.

The genus Polygonum has not escaped the numerical increase resulting from the extension of area of British India and the influx of new collections, which have occurred since the publication of vol. v. of the *Flora of British India* in 1890. Nine species have been added to the number given in the *Flora of British India:* of these, only two are new discoveries since the publication of vol. v; of the remainder, some had been overlooked when the account in that volume was written, while the advance of the Indian frontiers, particularly on the west, has rendered necessary the inclusion of others. Descriptions of those additional species have been given, so as to obviate the necessity of consulting various books which quite likely might not be readily accessible to the botanist in India. Species, varieties, and localities new or not mentioned in the *Flora of British India* are distinguished by an asterisk.

Section I.—Kœnigia Hook. f.

1. Polygonum islandicum Hook. f.

VI.—North-West Himalaya: (2) Baltistan; Dessai, 13,000 ft., *C. B. Clarke,* No. 29813 B! Karpuchu Valley, 13-14,000 ft, *Duthie,* No 11975! (5) Ladakh; Indus Valley, 12-14,000 ft., *Stoliczka*! (6) Zanskar; North-West from Padam, 12,000 ft., *Stoliczka*! (7) Rupchu; Indus Valley, 12-14,000 ft., *Stoliczka*! (8) Spiti and Parang; Nako, 14-16,000 ft., *Thomson*!

Section II.—Eleutherosperma Hook. f.

2. Polygonum delicatulum Meisn.

VI.—North-West Himalaya: (12) Kashmir; Musjid Valley, 12-13,000 ft., *Duthie,* No. 13222! (19) Kangra; Laka, *Edgeworth*! (21) Garhwal; Rhudughera-ka Godh, *Duthie,* No. 206! Taulea under Srikanta, 12-13,000 ft.,

Duthie, No. 540! (22) Kumaon; Milam and Ralum, 12,000 ft. *Strachey & Winterbottom*, No. 38!

VIII.—EASTERN HIMALAYA: (1) Sikkim; Tongloo, 10,000 ft., *King*, No. 4965! Phalut, 11,000 ft, *Thomson*! Sandakphu, 12,000 ft., *Gamble*, Nos. 766 and 8402! Phullalong, 11,000 ft., *C. B. Clarke*, No. 13403! Islumbo, 12,000 ft., *C. B. Clarke*, No. 25563! Jongri, 13-15,000 ft., *T. Anderson*, No. 594! Bloktan, near Jongri, *King's collector*! Niapokri, 12,000 ft., *King's collector*! Momay Samdong, 17,000 ft., *Gammie*, No. 696! Tankra, 15,500 ft., *Gammie*, No. 582! Yakla Pass, 16,000 ft., *C. B. Clarke*, No. 10192! (2) Tibet and Bhutan; Patang-la, 10,000 ft, *King's collector*, No. 4163! Ze-lep-la, *King's collector*! Gup-ten-de-la, a little above Chumbi, *King's collector*!

3. Polygonum filicaule Wall.

VI.—NORTH-WEST HIMALAYA: (11) Hazara; Kagan Valley, 14,400 ft., *Duthie*, No. $\frac{20113}{b}$! (12) Kashmir: Sind Valley, 12,000 ft., *C. B. Clarke*, No. 30998! Yamham Pass, 13-14,000 ft., *Duthie*, No. 14184! (19) Kangra; Laka, *Edgeworth*! (22) Kumaon; Ralum, 12-14,000 ft., *Strachey & Winterbottom*, No. 37!

VII.—NEPAL: Gossainthan, *Wallich*, Nos. 1694 and 1725! Chiami, 12,000 ft., *King's collector*!

VIII.—EASTERN HIMALAYA: (1) Sikkim; Tongloo, 10,000 ft., *King*! *Gamble*, No. 2697 B! Phullalong, 11,000 ft., *C. B. Clarke*, Nos. 13416 C and E, and 25696 D! Chandogiri, 11,000 ft., *Gamble*, Nos. 82 B and 773! Singalelah, 10,000 ft., *Gammie*, No. 66! Roskah, 10-11,000 ft.; Jongri, 15,000 ft.; Bloktan, Chokka, and Chooabama, near Jongri, *King's Collector*! Momay Samdong, 15,500 ft., *Gammie*! Lachung Valley, 12,500 ft., *Gammie*, No 945! Tankra, 10,000 ft., *Gammie* No. 428! (2) Tibet and Bhutan; Chumbi, *Dungboo*! Nathoot, east of the Chumbi Valley, Sikkim side, *King's* No. 4294! Ga-ling, between Chumbi and Phari, *Dungboo*!

VAR. **cæspitosa.**

VIII.—EASTERN HIMALAYA: (1) Sikkim; Taktoh, 10,000 ft., *King's collector*!

This is a very dwarf form, very small in all its proportions, and not more than two inches high. It is not necessarily a more alpine form as the locality quoted above is at the lowest level for the species.

*VAR. **villosa.**

VII.—NEPAL: Huanangi, 10,000 ft., *King's collector*!

VIII.—EASTERN HIMALAYA: (1) Sikkim; Gnatong, 12,000 ft., *Dungboo*! Gnatut, 15,000 ft., *King's collector*!

This is a very distinct variety, named by Major Cummins, and easily distinguished by its very hirsute stem and leaves.

Polygonum delicatulum and *Polygonum filicaule* evidently grow not infrequently in close intimacy, as on several sheets in the Calcutta Herbarium, the two are inextricably mixed up, as if gathered in the same tuft.

SECTION III.—AVICULARIA Meisn.

4. ***Polygonum biaristatum** Aitch. & Hemsley, *Jour. Linn. Soc.*, vol. xviii, p. 90.

A small prostrate glabrous shrub with twisted, often very short branches. *Leaves* small, crowded, subcoriaceous, elliptic or obovate, 4-8 mm. long, often abruptly and shortly acuminate, sessile or very shortly petioled. *Stipules* large, bifid, with two long excurrent nerves. *Flowers* axillary, solitary or in pairs, sessile or shortly pedicelled, 2-4 mm. in diameter. *Perianth* red, 5-partite, segments alike and rather fleshy or with the two inner segments thinner. *Stamens* 8, filaments dilated at the base. *Ovary* glabrous, styles terete. *Nut* triquetrous.

I.—NORTH-WEST FRONTIER: (1) Afghan border; Seratigah, Kurram Valley, 12,000 ft., *Aitchison*, No. 816!

This description is adapted from that in the *Journal of the Linnean Society* quoted above.

5. **Polygonum recumbens** Royla.

VI.—NORTH-WEST HIMALAYA: (12) Kashmir; Basaoli, 4,500 ft., *C. B. Clarke*, No. 31542 B! (15) Kunawar-Bashahr; Wangtu Valley, below Grammon, *Brandis*, No. 3547! Pasada, 6,000 ft., *Lace*, No. 1082! (19) Kulu; Dharmsala, 7,000 ft., *C. B. Clarke*, No. 24003 B! (20) Simla; *Griffith*! Elysium Hill, 7,000 ft., *Gamble*, No. 4715 C! (21) Garhwal; Deoban Range, 7-8,000 ft., *Duthie*, No. 1222! Landour, 7,500 ft., *Vicary*! Mussoorie, 7,000 ft., *King*! *Duthie*, No. 746! (22) Kumaon; *Anderson*! Girgaon, 6,000 ft., *Strachey & Winterbottom*, No. 41!

6. **Polygonum cognatum** Meisn.

VI.—NORTH-WEST HIMALAYA: (4) Dras; Dras and north of the Zozi-la, *Stoliczka*! Dras Valley, 11-12,000 ft., *Duthie*,

No. 11656! (6) Zanskar; East of the Pensi-la, and west of Padam, 12,000 ft., *Stoliczka*! (9) Chitral; Lowari Pass, 10,000 ft., *Harriss*, Duthie's No. 16593!

7. Polygonum paronychioides C. A. Mey.

I.—North-West Frontier: (1) Afghanistan; 3,500 ft., *Aitchison*, No. 561! Kohat to Kurram, *Bellew*, No. 160! Waziristan; Barwand, 4,000 ft., *Harusukh*, Duthie's No. 15634!

VI.—North-West Himalaya: (1) Gilgit, 9,000 ft., *Giles* No. 11! (2) Baltistan; Chatpani Nala, 10-11,000 ft., *Duthie*, No. 13823! (4) Dras; Thatayan, 11,000 ft., *Gammie*! (6) Zanskar; 20 miles north-west of Padam, 12,000 ft., *Stoliczka*! (7) Rupchu; south of the Tok-ling-la, 13,500-15,000 ft., *Stoliczka*! (8) Spiti and Parang; ascent to Kibar, 13,000 ft., *T. Thomson*! (9) Chitral and Dir; Ziarat, 7-8,000 ft., *Duthie's* No. 16587! (11) Hazara; Kagan Valley, 9,000 ft., *Inayat*, Duthie's No. 20126! (12) Kashmir; valley of the Kishengunga, *Strachey & Winterbottom*, No. 594! (15) Kunawar; Pangi, *Stoliczka*! Kuri and Changrezing, 11-12,000 ft., *Stoliczka*! (18) Chamba; Triloknath to Jurma, 9,000 ft., *Lace*, No. 1682!

8. Polygonum salicornioides Jaub. & Spach.

I.—North-West Frontier: (3) Scinde; ex *Flora of British India*.

There are no specimens of this species in the Calcutta Herbarium.

9. Polygonum aviculare Linn.

I.—North-West Frontier: (1) Afghan border; Kurram Valley, *Aitchison*, Nos. 632 and 655! Kohat to Tonk, *Bellew*, No. 578 B! Peshawar; *Stewart*! (2) British Baluchistan; Quetta, 6 000 ft., *Duthie*, No. 8704! Fort Sandeman, 4,600 ft., *Harusukh*, Duthie's No. 19001!

VI.—North-West Himalaya: (5) Ladakh; Indus Valley, Upshi to Leh, 12-14,000 ft., *Stoliczka*! (9) Chitral and Dir, near Drosh, 4-5,000 ft., *Hamilton*, Duthie's No. 17917! (11) Hazara; *Stewart*! Kagan Valley, *Inayat*, Duthie's No. 20120! (12) Kashmir; near Kashmir City, *Strachey & Winterbottom*, No. 274! Kamri Valley, 10-11,000 ft., *Duthie*, No. 12539! Baragam, 9,000 ft., *Duthie*,

No. 13963! (13) Kistawar and Badrawar; Badrawar, 4-10,000 ft., *Stoliczka*! (15) Kunawar; Chini, *Brandis*, No. 2749! Pangi, *Brandis*, No. 4001! (18) Chamba; Nurpur, 4,000-5,500 ft., *Schlagintweit*! (20) Simla, 7,000 ft., *Schlich*! (22) Kumaon; Near Milum, 11,500 ft., *Strachey & Winterbottom*, No. 21! Dhauli Valley, *Duthie*!

10. *Polygonum Bellardi All. (*Fl. Pedem. ii, 205, t. 90, f. 2*).

Annual, glabrous; stem erect, 20 to 45 cm. long, branches slender grooved, nodes distant. *Leaves* sessile, elliptic, lanceolate, acute, 2 to 3·8 cm. long, ·4 to ·7 cm. broad, flat, midrib distinct, lateral nerves obscure or none. *Stipules* membranous, hyaline, lacerate in their upper half, with a few prominent nerves. *Flowers* on short pedicels as long as the perianth, in clusters of 2 to 3 in the axils of tubular hyaline few-nerved slightly lacerate bracts, distant on a long slender raceme. *Nutlet* trigonous, included, finely punctate or shining.

I.—North-West Frontier: (1) Afghan border; Kurram district, *Aitchison*, No. 656! (2) British Baluchistan; Rakh Darkhel, Peshin Valley, 4,800 ft., *Lace*, No. 3317.

VI.—North-West Himalaya: (9) Chitral and Dir; Dir, 6,000 ft., *Harriss*, Duthie's No. 16584! (11) Hazara, 3,500 ft., *Stewart*, No. 443!

11. Polygonum setosum Jacq. (*Obs. iii, 8, t. 57*).

Shrubby, glabrous, 15 to 30 cm. high, more or less tufted. *Root-stock* woody, as thick as the little finger with bases of old shoots; branches 15 to 30 cm., erect or ascending, flexuous or geniculate, terete below, triquetrous above, grooved; internodes elongate, lower shorter than the leaves, upper longer than the leaves, shortened again in the inflorescence. *Leaves* very shortly petioled, distinctly articulated with the pulvillus; lamina linear-lanceolate or subulate, 2 to 4·5 cm. long, ·4 to ·8 cm. broad, mucronate, margin revolute, midrib distinct with many parallel veins running obliquely forward from the midrib to merge in the margin. *Stipules* membranous, sub-hyaline, lacerate, setose at the mouth, with many nerves, at first tubular, then longitudinally split anteriorly. *Flowers* on short pedicels, articulated below the perianth, in clusters of 2 to 3 in the axils of infundibuliform slightly lacerate bracts on at first somewhat dense but latterly interrupted terminal racemes. *Perianth*-tube short, segments in two series, 2 outer and 3 inner, subequal. *Stamens* 8, inserted on the throat, 3 large and 5 small. *Nut* trigonous, polished.

I.—North-West Frontier: (1) Afghan border; Kurram Valley, *Aitchison*, No. 656!

VI.—North-West Himalaya: (15) Kunawar; Pangi, *Stoliczka*!

The many-nerved stipules, and the peculiar venation of the leaves with their revolute margins, make this species quite distinct. The Calcutta sheets are intermediate in character between *Polygonum setosum* Jacq., and *Polygonum luzuloides* Jaub. & Spach, as described in Boissier's *Flora Orientalis*, vol. iv, pp. 1038-1039, and as figured in Jaubert and Spach's *Ill. Or.*, *tt.* 125 and 126. Bossier describes *Polygonum luzuloides* as very close to *Polygonum setosum*, and the Calcutta sheets would support the idea that they are really one species.

12. Polygonum tubulosum Boiss.

I.—North-West Frontier: No specimens in the Calcutta Herbarium.

VI.—North-West Himalaya: (4) Dras, 10,000 ft., *Duthie*, No. 13733! (6) Zanskar, 5-8,000 ft., *T. Thomson*! Near Rangdam Goupa, 12-14,000 ft., *Stoliczka*! (9) Chitral and Dir; Mirga 7,200 ft., *Gatacre*, Duthie's No. 17512! (11) Hazara, 3,500-5,000 ft., *Stewart*, No. 326! (12) Kashmir; Kishengunga Valley, below Gurais, 8-9,000 ft., *Duthie*, No. 14101! (14) Lahul; *Brandis*, No. 3545! (21) Garhwal; Ganges Valley above Jangla, 9-10,000 ft., *Duthie*, No. 530.

13.* Polygonum polycnemoides Jaub. & Spach. (*Illustr. ii, 20 t. 120*).

Annual, glabrous, prostrate, much branched; branches 7 cm. to rarely 30 cm. long, filiform, flexuous, angled but not grooved, often finely scaberulous on the angles; internodes short, 8 mm. to 16 mm. long, very uniform, but becoming very short towards the apex and entirely covered by the stipules. *Leaves* minute, sessile, alternate, fleshy, flat, entire, obsoletely 1-nerved, mucronulate, 8 mm. long or less. *Stipules* delicate, membranous, white, hyaline, obsoletely 3-nerved, more or less dentate, the lower shorter than the leaves, the upper as long or a little longer and imbricating. *Flowers* axillary, solitary or in pairs, very shortly pedicelled. *Perianth*-segments 5, 3 internal, 2 external. *Stamens* 8, inserted on the perianth-throat, unequal. *Nut* trigonous, very small, included, minutely punctate.

I.—North-West Frontier: (1) Afghan border; *Griffith*, K. D., No. 4103! Kurram Valley, *Aitchison*, No. 215! (2) British Baluchistan; Bolan Pass, *Griffith*, No. 589 (1725)!

VI.—North-West Himalaya: (1) Gilgit; Chaelu, 10,000 ft., *Giles*, No. 61! (2) Baltistan; near Gorakote, *Strachey & Winterbottom*, No. 723! Baleshahr Nullah, Astor, 7-8,000 ft., *Duthie*, No. 12493! Shingo Valley 10-11,000 ft., *Duthie*, No. 11908! (15) Kunawar; Pangi, *Stoliczka*!

This species could be confused, in India at least, with only *Polygonum paronychioides*, *Polygonum afghanicum* or *Polygonum tubulosum*. The absence of a perennial woody rootstock distinguishes it from the first two species, while its much more slender, flexuous, and almost leafless-looking habit distinguishes it from *Polygonum tubulosum*. Boissier (*Flora Orientalis*, vol. iv, p. 1033) without assigning any reason, expresses a doubt of the correctness of Meisner's statement (*DC. Prodr.* xiv, 92) that this species is found in Afghanistan. Apparently Boissier could not have seen Griffith's original numbers, which Meisner quotes, and which are also in the Calcutta Herbarium: they leave no room for doubt.

14. *Polygonum afghanicum Meisn. (*DC. Prodromus xiv, 90*).

Somewhat shrubby, with many erect, filiform, angled, pruinose-papillose branches; internodes about 1·3 cm. long, shorter above, and concealed by the stipules, which below are shorter than the internodes and hyaline, obsoletely 3-nerved, ciliate lacerate. *Leaves* linear, 8-10 mm. long, setosely mucronate, midrib often lighter in colour than the lamina, otherwise nerveless, flat or with the margins revolute towards the apex, base very slightly narrowed. *Flowers* axillary, usually solitary, sessile. *Perianth*-segments 5, somewhat elongate, the two outer shortly awned. *Stamens* 8, unequal. *Nut* trigonous, finely puncticulate.

I.—North-West Frontier: (1) Afghanistan, 3,000 ft. and over, *Aitchison*, No. 470! (2) British Baluchistan; *Stocks* (Herb. N. Dalzell, Bombay), No. 1135! Gwal, 6,000 ft., *Lace*, No. 3732!

The woody rootstock and erect strict habit distinguish this species quite clearly from *Polygonum polycnemoides*, which has an annual root and very slender and flexuous branches.

15. Polygonum molliæforme Boiss.

VI.—North-West Himalaya: (3) Nubra, 14-16,000 ft., *T. Thomson*! (?) Zaling-Karpo Pass, and south of Bhabeh, *Stoliczka*!

16. Polygonum plebejum R. Br.

I.—NORTH-WEST FRONTIER AND PUNJAB: (1) Afghan border; Kohat to Kurram, *Bellew*, No. 578 A.! (2) British Baluchistan; No specimens in the Calcutta Herbarium. (3) Scinde; No specimens in the Calcutta Herbarium. (4) Gujrat; No specimens in the Calcutta Herbarium. (5) Punjab west of the Sutlej; Peshawar, *Stewart*, Lahore, *Stewart*, Herb. Kurz, No. 2545! *Brandis*, Herb. Kurz, No. 2663! (6) Punjab east of the Sutlej; No specimens in the Calcutta Herbarium. (7) Bhawalpur, Rajputana, and Indore; No specimens in the Calcutta Herbarium.

II.—CENTRAL PROVINCES: (1) Central Provinces; *Jerdon*!

III.—PENINSULAR INDIA: (2) Canara; North Canara, Siddapore, *Talbot*, No. 1080!

IV.—UPPER GANGETIC PLAIN: Lucknow, *T. Anderson*! Banda, *Mrs. Bell*!

V.—BENGAL: (2) Chutia Nagpur; Dorunda, *Prain*! (5) North Bengal; Caragola Ghat, *King*! Naogaon, *Prain*! (6) Central Bengal; Kushtia, *Kurz*! Sibpur, *Kurz*!

VI.—NORTH-WEST HIMALAYA: (19) Kulu; Beas Valley, from Bijaura and the base of the Rottang Pass, 4-6,500 ft., *Stoliczka*! (21) Garhwal, *King*!

VII.—NEPAL: Sheopara, *Wallich*, No. 1691 G.!

VIII.—EASTERN HIMALAYA: (1) Sikkim and Darjeeling district, *T. Anderson*! Sivoke, 800 ft., *King*! (2) Bhutan; Shang-zong-la, 8,000 ft., *Dungboo*!

IX.—ASSAM: (4) Khasia Hills; *Simons*! (8) Brahmaputra Valley; Dikho Valley, *Watt*, No. 10348!

X.—BURMA: (1) Chittagong District; Barkhal, on the Karnaphuli River, *Lister*, No. 119! (11) Sittang Valley; Tonkyeghat, *Kurz*, No. 519!

VAR. **effusa.**

I.—NORTH-WEST FRONTIER: (2) British Baluchistan, *Duke*! Quetta, 5,600 ft., *Lace*, No. 4076! Fort Sandeman, *Harsukh*, Duthie's No. 20643! (7) Rajputana; Jodhpur, *King*!

IV.—UPPER GANGETIC PLAIN: Dehra Dun, 2,000 ft., *King*!

V.—BENGAL: (2) Chutia Nagpur, *Wood*!

VI.—NORTH-WEST HIMALAYA: (4) Chitral; Bundai, 4,000 ft., *Harriss*, Duthie's No. 16581!

IX.—ASSAM: (7) Manipur; Noung Shong Khong Valley, 3,900 ft., *Watt*, No. 6302!

X.—BURMA: (6) Shan Hills; Fort Stedman, *Abdul Huk*! (10) Irrawaddy Valley; *Kurz*, No. 2212! (12) Tenasserim; Chounza, 3,000 ft., *Gallatly*, No. 582!

VAR. **elegans.**

II.—CENTRAL PROVINCES: (1) Central Provinces; Saugor, *Vicary*!

IV.—UPPER GANGETIC PLAIN: Oude; *Wallich*, No. 1691 C!

V.—BENGAL: (5) North Bengal; Mahanadi River, *T. Thomson*! (6) Central Bengal, near Kushtia, *Kurz*! Calcutta, *C. B. Clarke*, No. 33570! Sibpur, *Kurz*!

VI.—NORTH-WEST HIMALAYA: (16) Kunawar and Bashahr; Pangi, *Stoliczka*! Runang Pass, 12,000 ft., *Lace*, No. 565! (18) Chamba; *Ellis*, No. 433! (22) Kumaon; *Wallich*, No. 1691 D! Naini Tal, *T. Anderson*!

VII.—NEPAL: *Scully*, No. 50!

VIII.—ASSAM: (6) Naga Hills; *Prain*! (8) Brahmaputra Valley; *Mann*, No. 47! Dibrughar, 300 ft., *C. B. Clarke*, No. 37726 A.! Kamikha in Kamrup, *King's collector*!

IX.—CHITTAGONG and BURMA: (1) Chittagong District; Kasalong, *Gamble*, No. 7865! (6) North and South Shan Hills; Bhamo, *J. Anderson*! Shan States, *Abdul Huk*, No. 30! Fort Stedman, *Abdul Khalil*! (12) Tenasserim; Chu-ku, *Gallatly*, No. 952!

VAR. **indica.**

II.—CENTRAL PROVINCES: Jubbulpore, *C. B. Clarke*, No. 31972! Saugor, *Jerdon*! Chanda District, *Duthie*, Nos. 9715, 9716, 9718! Tapti Valley, *Duthie*, No. 10545.

III.—PENINSULAR INDIA: (2) North Canara; *Talbot*, No. 57! (4) Nilgiri Hills; Chemenguli, 7,000 ft., *Gamble*, No. 16218! (7) Northern Circars, *Cleghorn*! Aska, Ganjam District, *Gamble*, No. 14174! Nandial, Karnul District, 1,000 ft., *Gamble*, No. 10928! Bukkapatam, Anantapur District, 1,500 ft, *Gamble*, No. 20945! Cuddapah District, 4,500 ft., *Gamble*, No. 15155! Arcot, *Griffith*! Shevaroi Hills, *Perrottet*, No. 381! (10) Mysore; Bangalore, *Cameron*!

V.—BENGAL: (2) Chutia Nagpur; Kadampur Valley, *Wood*! Manbhum, *Campbell*! Singbhum, *Haines*, No. 143! (6) Central Bengal; Jessore, *C. B. Clarke*, No. 34587 H!

X.—BURMA: (6) Shan Hills; Ruby mines, *Abdul Huk*, No. 42! Khoni, *Prazer*! Taungyi, *Abdul Khalil*! (7) Pegu; Yomah, *Kurz*, No. 519!

VAR **brevifolia.**

I.—NORTH-WEST FRONTIER: (5) Punjab west of the Sutlej; Lahore, *Stewart*, Herb. Calc., No. 2545!

IV.—UPPER GANGETIC PLAIN: Etawah, *Hume*!

V.—BENGAL: (6) Central Bengal; Jessore, *Parry*! Bussirhat, *C. B. Clarke*, No. 21757 B! Baraset, *C. B. Clarke*, No. 34882! Jahanabad, Hughli District, *J. D. Nusker*! Sibpur, *Kurz*! (7) West Bengal, Ranigunge, *Kurz*!

VI.—NORTH-WEST HIMALAYA: (11) Hazara; Siran Valley, *Inayat*, Duthie's No. 20119! (18) Chamba; Dalhousie, 6,700 ft., *C. B. Clarke*, No. 23010 B! (19) Kulu; from Bilaspur to Mandi, 2-300 ft., *Stoliczka*! (20) Simla; Sutlej bank below Kumharsen, 3,000 ft., *Gamble*, No. 6144 B! (21) Garhwal; Mussoorie, 6,000 ft., *King*! Landour, 7,000 ft, *Vicary*! (22) Kumaon; Naini Tal, 7,000 ft., and Almora, 5,500 ft., *Strachey & Winterbottom*, No. 23!

VAR. **micranthema.**

I.—NORTH-WEST FRONTIER: (1) Afghan border; Shaik Budin, *Sanders*! (3) Scinde; Karachi District, *Ryan*! (4) Cutch; *Stoliczka*! (5) Punjab west of the Sutlej; Lahore, *Stewart*! (7) Rajputana; Abu Lake, *King*! Jodhpur, *King*!

IV.—UPPER GANGETIG PLAIN: Fattehgarh, *T. Anderson*! Dehra Dun, *King*!

V.—BENGAL: *Kurz*!

VIII.—EASTERN HIMALAYA: *T. Anderson*!

X.—BURMA: (6) Shan Hills, *Abdul Huk*, No. 16! Kyoukse, *Abdul Huk*!

VAR. **Griffithii.**

I.—NORTH-WEST FRONTIER: (1) Afghan border; Peshawar, *Stocks*! (7) Rajputana and Indore; Marwar, *King*! Goona, *King*! Mordr, *Maries*, No. 234!

II.—CENTRAL PROVINCES: Saugor, *Jerdon*! Jubbulpur, *Beddome*, No. 47! *C. B. Clarke*, No. 31974 A.! *Prain*, No. 46! Khandwa, *Duthie*, No. 8398!

III.—PENINSULAR INDIA: (1) Concan; *Stocks*! (4) Malabar; *Stocks*! *Law*!

IV.—UPPER GANGETIC PLAIN: (1) Agra and Oudh; Fattehgarh, *Griffith*! By the Chambal near Etawah, *Duthie*! (2) Bundelcund; Mahobra, *Duthie*, No. 6474!

V.—Bengal: *Griffith*! (4) Behar, *Kurz*!

var. polyneura.

III.—Peninsular India: (2) North Canara; Sirey, *Talbot*, No. 389!

Exclusive of the varieties *scindica* and *Miqueliana*, which have not been identified by the writer as present in the Calcutta Herbarium there have been enumerated above no fewer than eight forms of *Polygonum plebejum* R. Br. The writer finds it very difficult to accept all these forms as belonging to one species. The varieties in their typical condition at least differ very much more markedly from each other than allied but admitted species, such as *Polygonum recumbens* and *Polygonum cognatum*, or *Polygonum paronychioides* and *Polygonum tubulosum*, do from each other. The writer under other conditions than the purpose of the present paper admits would be strongly inclined to form four species, the composition of which may be briefly indicated here.

1st species = Polygonum plebejum R. Br. proper.
var. effusa.
var. elegans.
var. micranthema.

2nd species = var. indica.
var. brevifolia.

3rd species = var. Griffithii.

4th species = var. polyneura.

The altitudinal distribution of those so-called varieties, to which the reader may here be referred, would tend to corroborate the writer's ideas, which he had formed purely on morphological grounds. The *var.* Griffithii, in particular, is morphologically very distinct, and has a very limited altitudinal range.

Section IV.—Amblygonon Meisn.

17. Polygonum orientale Linn.

IV.—Upper Gangetic Plain: (1) Agra and Oudh; Dehra Dun, 2,000 ft., *Duthie*, No. 1973!

V.—Bengal: (5) North Bengal; Garidura in the Terai, *Gamble*, No. 2696 B.! Caragola, *King*! (6) Central Bengal; Calcutta, *C. B. Clarke*, No. 3641! Howrah, *T. Anderson*! Sibpur, *Kurz*! (8) East Bengal; Comilla, *C. B. Clarke*, No. 6929!

VI.—North-West Himalaya: (12) Kashmir, near Srinagar, *Schlagintweit*, No. 4458!

IX.—Assam: (6) Naga Hills; Jaboca, *Prain's collector*, No. 715! (8) Brahmaputra Valley; Gauhati, *Simons*! *Watt*, No. 12228! (9) Sylhet and Cachar; *Wallich*, No. 1709 B.!

X.—*Burma: (1) Chittagong District; Kodala Hill, *King's collector*, Nos. 364 and 527! (6) Shan Hills; Fort Stedman, *Abdul Huk*! Shwebo, *Abdul Huk*, No. 80! Hetto and Taungyi, *Abdul Khalil*! (10) Irrawaddy Valley; Mandalay and Mengoon, *J. Anderson*! (11) Sittang Valley; *Kurz*, No. 520! (12) Tenasserim; Chu-ku, *Gallatly*, No. 929!

18. Polygonum tomentosum Willd.

II.—Central Provinces: Chanda District; *Duthie*, No. 9714!

III.—Peninsular India: (?) (2) Canara; Birchy, *Talbot*, No. 2051! (8) Carnatic; *G. Thomson*! (10) Mysore; *G. Thomson*!

V.—Bengal: *T. Anderson*!

IX.—Assam: No specimens from this sub-sub-area in the Calcutta Herbarium.

X.—Burma: (1) Chittagong District; Kodala Hill and Jandachin Hill, *King's collector*, Nos. 184 and 237! (7) Pegu; Yomah; Phoungyee, *Kurz*, No. 526! (9) Arracan; Kolodyne Valley, *Kurz*! (10) Irrawaddy Valley; Rangoon and Prome, *Wallich*, No. 1709 D, *in whole* in Calcutta Herbarium! (11) Sittang Valley; Toungoo, *Kurz*, No. 525!

XI.—Malay Peninsula and Andamans: (1) Peninsula; Perak, Ipoh, *Curtis*, No. 3178! Simpang, *L. Wray*, No. 2034! (2) Andamans; Hobdaypur and Port Mouat, South Andaman, *King's collector*! Great Cocos Island, *Prain*!

19. Polygonum limbatum Meisn.

II.—Central Provinces: Saugor, *Jerdon*!

III.—Peninsular India: *Beddome*, No. 112! (1) Concan, *Stocks! Law*! (4) Malabar, *Stocks*!

IV.—Upper Gangetic Plain: (2) Bundelcund, *Vicary*!

V.—Bengal, *Griffith*! *T. Thomson*! (2) Chutia Nagpur; Oomra, Manbhum, 1,000 ft., *C. B. Clarke*, No. 34433 C!

X.—*Burma: (6) Shan Hills; Bhamo, *J. Anderson*! (10) Irrawaddy Valley; Minbu district *Gage*!

Section V.—Tovara A. Gray.

20. Polygonum virginianum Linn.

VI.—North-West Himalaya: (11) Hazara; Kagan Valley, *Inayat*, Duthie's No. 20128! (18) Chamba; Bassued Forest, 6,000 ft., *Lace*, No. 1982!

VIII.—Eastern Himalaya: (1) Sikkim; *Kurz*! Semari, Balasun, 7-8,000 ft., *Dungboo*!

IX.—*Assam: (6) Naga Hills; Piffima, 3,000 ft., *C. B. Clarke*, No. 40937 E.!

X.—*Burma: (5) Kachin Hills; *Shaik Mokim*!

Section VI.—Bistorta Tourn.

21. Polygonum viviparum Linn.

VI.—North-West Himalaya: (1) Gilgit; *Giles*! (6) Zanskar; East of Suroo, Zalung Karpo Pass, 14-17,000 ft., *Stoliczka*! (7) Rupchu; *Stoliczka*! (8) Spiti; Sungnum and Kibles, *Stoliczka*! (11) Hazara; Kagan Valley, 11,200 ft., *Inayat*, Duthie's No. $\frac{20122}{b}$! (12) Kashmir; Gurais Valley, *Strachey & Winterbottom*, No. 548! Kishengunga Valley, *Strachey & Winterbottom*! Sangam Valley, 13,000 ft., *Duthie*, No. 13551! Musjid Valley, 12-13,000 ft., *Duthie*, No. 13244! Sind Valley, below Baltal, 9-10,000 ft, *Duthie*, No. 11535! (14) Lahul, *Hay*! Kardong, *Schlagintweit*, No. 3692! Rotang Pass, Chandra Valley side, 13,000 ft. *Holland*! (15) Kunawar; Pangi, *Stoliczka*! *Heyde*! (21) Garhwal; Near Mussoorie, *King*! Phuladaru in Nila Valley, 11-12,000 ft., *Duthie*, No. 203! (22) Kumaon, near Ralum, 11,500 ft., *Strachey & Winterbottom*, No. 5! Nipchang Valley in Darma, 14-15,000 ft., *Duthie*, Nos. 3331 and 3348!

VIII.—Eastern Himalaya: (1) Sikkim; Jongri to Aloktong, 13-15,000 ft., *T. Anderson*! Jongri, 13,000 ft., *Gammie*! Bloktan, near Jongri, *King's collector*! Kinchin, 15,000 ft., *King's collector*, No. 556! Jongri and Lachen, *King's collector*! Tankra, 13,500 ft., *Gammie*, No. 419! Sebu Valley, 14,000 ft., *Gammie*, No. 1149! (2) Tibet and Bhutan; Patang-la, 10,000 ft., *King*, Nos. 4184 and 4186! Pedong-Oong, *Dungboo*! Pheemong, near Chumbi,

Dungboo! Beerom, 12,000 ft., and Rookah, 11,000 ft., *King's collector*! Syumpoo, *King's collector*, No. 106! Teumtong, 11,000 ft., *King's collector*! Phari, *King*, No. 4582!

22. Polygonum sphærostachyum Meisn.

VI.—North-West Himalaya: (21) Garhwal; Dudutoli, 10,000 ft., *Strachey & Winterbottom*, No. 1! Kuari Pass, 13,000 ft., *Duthie*, No. 4363! (22) Kumaon; *Wallich*, No. 1683 B!

VII.—Nepal: *Wallich*, No. 1716! *Scully*, No. 171! Gosain Than, *Wallich*, No. 1683 D!

Wallich No. 1716 is quoted in the *Flora of British India* as the type of *Polygonum amplexicaule* var. *speciosa*, which in the Calcutta Herbarium is represented by the Wallichian sheet 1716 A.

VIII.—Eastern Himalaya: (1) Sikkim; Gnatong, 12,000 ft., *King's collector*, No. 4378! Giagong, 13,000 ft., *King's collector*! Tallong above Tallum, 13,000 ft., *King's collector*! Tankra, 15,500 ft., *Gammie*, No. 572! Donkia 15-18,000 ft., *Gammie*, No. 812! (2) Tibet and Bhutan; Cho-le-la, *King's collector*! North-West of Chumbi below Tangkar-la, 14,000 ft., *Waddell*! Do-to, 4 miles from Phari, *Dungboo*! Phari, *King*, No. 4592! Va-ru-ting, Tibet-Bhutan frontier, *King's collector*!

23. Polygonum perpusillum Hook. f.

VI.—North-West Himalaya: (21) Garhwal; above Chinpul, 14-15,000 ft., *Duthie*, No. 534! Above Bhowani, 13-14,000 ft., *Duthie*, No. 4360! (22) Kumaon; above Ralum, 14,500 ft., *Strachey & Winterbottom*, No. 39!

VIII.—Eastern Himalaya: (1) Sikkim; Kinchin, 14,000 ft., *King's collector*! Cho-la, *King's collector*, No. 4489! Tankra, 15,000 ft., *Gammie*, No. 556! Tang-ka-la, *King's collector*! (2) Tibet and Bhutan; Punka-bee-se-mo, *Dungboo*, No. 378!

24. Polygonum paleaceum *Wall.*

IX.—Assam: (4) Khasia Hills, *Wallich*, No. 1684! *Oldham*, No. 8! *Mann*, Nos. 524, 614, 872, all from 3-6,000 ft.: Shillong 6,000, *C. B. Clarke*, No. 38681 A! *Gallatly*, No. 138! *Prain*, No. 26! Tserra, 4-4,500 ft., *C. B. Clarke*, Nos. 5364 and 7199!

X.—*Burma: (6) Southern Shan Hills; Saikan, *Abdul Khalil*!

The writer agrees with Forbes and Hemsley in the opinion expressed in their *Enumeration of Chinese Plants*, under *P. confusum*, (*Jour. Linn. Soc.*, vol. xxvi, p. 336) that it is questionable whether Meisner's *Polygonum confusum* is the same as Wallich's *Polygonum palaceum.*

In De Candolle's *Prodromus*, vol. xiv, p. 125, Meisner quotes Wall. Cat. No. 1684, which is the type of *Polygonum paleaceum*, under *Polygonum sphærostachyum.* Under *Polygonum confusum* Meisner (*Wall. Plant. Asiat. Rar.*, vol. iii, p. 53) quotes Wall. Cat. No. 1683, which is *Polygonum sphærostachyum*, and he adds a note to the effect that *Polygonum confusum* grows along with and in the same places as *Polygonum sphærostachyum*, from which one would infer that Meisner's *Polygonum confusum* was not confined to Assam. Now if it were the same as *Polygonum paleaceum*, it would be so limited. The writer is, therefore, of opinion that Meisner's *P. confusum* is merely a form of *Polygonum sphærostachyum.*

25. * Polygonum Bistorta Linn. (*Sp. Plant. 360*).

Rootstock thick, twisted; annual stems glabrous, simple or with occasionally a branch-peduncle from the axil of one or two of the upper leaves; internodes long, 4-12 cm. *Leaves* glabrous or puberulous on the lower surface, lower leaves cordate with a very long petiole winged above, length of lamina to as much as 14 cm., breadth to as much as 8 cm., length of petiole to as much as 20 cm., upper leaves subsessile on the top of the stipular tube, half-amplexicaule, cordate-lanceolate, 2-5·5 cm. long and 1-1·5 cm. broad. *Stipules* glabrous, tubular, about 5 cm. long, eciliate nervosely striate. *Spike* dense, cylindrical, oblong-obtuse, 2·5-4·5 cm. long, about 2 cm. broad. *Flowers* large, on pedicels longer than the flowers, articulating just below the perianth, and arising in the axils of pale brown, membranous, lanceolate, entire, closely imbricating bracts. *Perianth* segmented almost to the base, segments 5 sub-equal, broadly oval, with 4-5 distinct veins. *Stamens* 8, filaments long slender exserted, anthers minute. *Nut* trigonous elongated, style long slender trifid above, stigmas capitate.

VI.—North-West Himalaya: *Royle*! (21) Garhwal; Binh Valley, 12-13,000 ft., *Duthie*, No. 541! Kumari Pass, 13,000 ft., *Duthie*, No. 4364!

VII.—Nepal, *Scully*!

This in no way differs from the typical European or American plants, but none the less has been confused with the variety *speciosa* of *Polygonum amplexicaule*, and with *Polygonum sphærostachyum.* It resembles the first in the size of the spike but differs altogether in

the leaves, and is quite different from the second both in spike and leaves. Royle's sheet contains both *Polygonum Bistorta* and *Polygonum amplexicaule*, and the name *Polygonum speciosum*, which fits neither, is applied to the mixture of both. Kurz had detected that the greater part of the sheet was *Polygonum Bistorta* and had so named it.

26. Polygonum amplexicaule Don.

I.—North-West Frontier: (1) Afghan border; Kurram Valley, *Aitchison*, No. 767!

IV.—Upper Gangetic Plain: Dehra Dun, *King*!

VI.—North West Himalaya: (9) Chitral; Mirga, *Gatacre*, Duthie's No. 17502. (11) Hazara. Kahi Galli, Black Mountains, 8-9,000 ft., *Duthie*, No. 7560! Kagan Valley, 8,000-14,400 ft., *Inayat*, Duthie's Nos. 20116, 20116 A, 20117, 20118 A! Siran Valley, *Inayat*, Duthie's No. 20118! (12) Kashmir; Gulmarg, 8-11,000 ft., *Aitchison*, No. 29! *C. B. Clarke*, No. 30820 A! Kangar, Sind Valley, 5,500 ft.; Shapeyan, Kashmir Valley, 6,000 ft., *Gammie*! Sangam Valley, above Liddarwat, 12-13,000 ft., *Duthie*, No. 13554! From Kotsu to Palgam, *Gamble*! (15) Kunawar; Wangtu Valley above Grammon. *Brandis*, No. 3553! Brua Gad, 8-9,000 ft., *Lace*, Nos. 374 and 456! (18) Chamba; Chamba to Padri Pass, *Schlagintweit*, No. 3563! Dalhousie, 7-8,000 ft., *C. B. Clarke*, Nos. 22331 B and 22640! (20) Simla; Sirmoor, *Falconer*! *Vicary*! Narkanda, *Stoliczka*! Jakko and Gowai, *Gamble*, No. 1387 C and 5319 B! (21) Garhwal; Mussoorie, *King*! *Duthie*, No. 642! Nag Tiba, 9-10,000 ft., *Duthie*, No. 749! Jangla, 8-9,000 ft., *Duthie*, No. 207! (22) Kumaon; *Wallich*, Nos. 1715, 1716-3! Kathee, 7,200 ft., and Kalimundi, 8,900 ft., *Strachey & Winterbottom*, No. 12! Valley of the Gori, 5,500 ft., *Strachey & Winterbottom*, No. 13! near Paton, 7,000 ft., *Strachey & Winterbottom*, No. 14! Naini Tal, *T. Anderson*! *Hume*, Herb. Kurz, No. 55! *Strachey & Winterbottom*, No. 12!

VAR. speciosa.

VI.—North-West Himalaya: (21) Garhwal; Deoban Range above Chakrata, 7,000 ft., *Duthie*, No. 1226!

VII.—Nepal: *Scully*, No. 264! Nampa Godh, 11-12,000 ft., *Duthie*, No. 5924! Baeary, *Wallich*, No. 1716 A! Megu, 13,000 ft., *King's collector*!

VIII.—EASTERN HIMALAYA: (1) Sikkim; Phalut, *T. Thomson*! Tongloo, 9,000 ft., *King*! *Gamble*, No. 785! Singaleleh, 10,000 ft., *C. B Clarke*, No. 13522C! Sehn-zen, *King*, No. 4428! Gnatong, 13,000 ft., *Pantling*! Jongri, 12,000 ft., *King's collector*, No. 87! Chooabama, 12,000 ft., *King's collector*! Ko-poop, *Dungboo*! Tumbok, 10,000 ft., *C. B. Clarke*, No. 12765F! Yakla, 12,000 ft., *C. B. Clarke*, No. 10093 A!

The Wallichian sheet of this species in the Calcutta Herbarium is numbered 1716 A, and labelled "*Polygonum cordifolium* Wall., Baeary, June, 1821." The Wallichian sheet in the Calcutta Herbarium which bears the No. 1716 is, as already mentioned, *Polygonum sphærostachyum* Meisn.

27. Polygonum affine Don.

VI.—NORTH-WEST HIMALAYA: (1) Gilgit; 13,000 ft., *Giles*, No. 131! Chuprot, *Strachey & Winterbottom*, No. 493! (4) Dras; 10,000 ft, *Duthie*, No. 13724! (8) Spiti and Parang; Upper Spiti Valley, 13-14,500 ft., *Stoliczka*! (9) Chitral and Dir; Lowari Pass, 10,500 ft., *Harriss*, Duthie's No. 16592! (11) Hazara; Tap to Masenno glacier, *Schlagintweit*, No. 7257! Siran Valley, *Inayat*, Duthie's, No. $\frac{20114}{a}$! Kagan Valley, 14,400 ft., *Inayat*, Duthie's No. 20115! (12) Kashmir; Gurais Pass, *Strachey & Winterbottom*, No. 493! Above Gulmarg, 10-11,000 ft., *Duthie*, No. 11273! Apharwat (Gulmarg), 13,500 ft., *Gammie*! Badzulkod Nala, Liddar Valley, 12-13,000 ft., *Duthie*, No. 13401! Pir Panjal, 11,000 ft., *Gammie*! *Levinge*, C. B. Clarke's No. 27141! (14) Lahul; *Hay*! Foot of the Bara Latsa Pass, *Schlagintiweit*, No 4030! Upper Bhaga Valley, 9,500-13,000 ft., *Stoliczka*! Rotang Pass, *Brandis*, No. 3559! (15) Kunawar; *Vicary*! Pangi, 11-16,500 ft., *Heyde*! (18) Chamba; *Ellis*! Chamba to Padri Pass, *Schlagintweit*, No. 3654! Sach Pass to Douai, *Lace*, No. 1467! (21) Garhwal; near Jumara camping-ground, 11-12,000 ft, *Duthie*, No. 204! Dudu Glacier moraine, 14-15,000 ft., *Duthie*, No. 532! Kuari Pass, 12-13,000 ft., *Duthie*, No. 4359! (22) Kumaon; *Wallich*, No. 1692! Near Milum, 14,500 ft. and below Ralum, 11,000 ft., *Strachey & Winterbottom*, No. 2! Pindi Glacier, 17,000 ft., *Collett*!

VII.—NEPAL: Budhi village, Western Nepal, *Duthie*, No. 5935!

28. Polygonum vaccinifolium Wall

VI.—North-West Himalaya: (12) Kashmir; Marbul Pass, 11,400 ft, *C. B. Clarke*, No. 31317 A! (15) Kunawar? Harang, 12,000 ft., *Brandis*, No. 3549! (20) Simla; Sirmoor, *Vicary*! (21) Garhwal; Mussoorie, 7,000 ft., *King*! Rocks in the Ganges above Jangla, 11-12,000 ft., *Duthie*, No. 531! (22) Kumaon; Milum and near Ralum, 12,000 ft., *Strachey & Winterbottom*, No. 3!

VII.—Nepal: *Scully*!

VIII.—Eastern Himalaya: (1) Sikkim; *Watt*, No. 5279! Sughoo, *T. Thomson*! Jongri, 13,500-15,000 ft., *T. Anderson*, No. 1119! *C. B. Clarke*, No. 25822 C! Ze-lep-la, *Dungboo*! Tang-ka-la, *King's collector*! Gnatong, 12,000 ft., *Pantling*! Nathoot, *King's collector*, No. 4506! Ongla-thang, below Kinchinginga, *King's collector*! Domkerka, 12,000 ft., *King's collector*! Lachung Valley, 9,000 ft., *Gammie*, No. 675! Tankra, 12,500 ft., *Gammie*, No. 444! Yakla, *King's collector*! (2) Tibet and Bhutan; Min-dook-la, *King's collector*, No. 527!

29. Polygonum Emodi Meisn.

VI.—North-West Himalaya: *Duthie*! (20) Simla; Narcanda, 9,000 ft., *Brandis*, No. 3558! (22) Kumaon, *Wallich*, No. 1693!

VIII.—Eastern Himalaya: *Hooker f.*! (1) Sikkim; Lachen, 9,000 ft., *King's collector*! Lachung Valley, 10,000 ft., *Gammie*!

Section VII.—Persicaria Meisn.

30. Polygonum glabrum Willd.

I.—North-West Frontier: (1) Afghan border; Peshawar, *Stewart*, No. 177! (3) Scinde; Herb. *Dalzell*, No. 1202! Meera Hills, *Dalzell*! (5) Punjab, west of the Sutlej; Lahore, *Brandis*, No. 3006! (7) Rajputana, Indore; Abu, *King*! Gwalior, *Maries*, No. 21!

II.—Central Provinces: Saugor, *Vicary*! near Bhamgarh, Khandwa District, *Duthie*, No. 8401! Chanda District, *Duthie*, No. 9711!

III.—PENINSULAR INDIA: (1) Concan; *Herb. Ind. Or. H. f. & T.*! (2) North Canara; *Talbot*, No. 450! Kala Nuddi, Vincholi, *Talbot*, No. 941! (4) Malabar; *Herb. Ind. Or. H. f. & T.*! (5) Cochin and Travancore; Cochin, *Gamble*, No. 14805! Travancore, 1,000 ft., *Bourdillon*, No. 46! (7) Northern Circars; *Cleghorn*! (8) Carnatic; *Herb. Ind. Or. H. f. & T.*! Narsapully, Anantapur District, 2,000 ft., *Gamble*, No. 15257!

IV.—UPPER GANGETIC PLAIN: *Herb. Ind. Or. H. f. & T.*! Lucknow, *Bonavia*! Ghiror, *Duthie*, No. 6475!

V.—BENGAL: (2) Chutia Nagpur; Kewtbar, Palamow, *Wood*! Lohardugga, 2,000 ft., *C. B. Clarke*, No. 33946! Domree, Hazaribagh, 1,000 ft., *C. B. Clarke*, No. 33871 D! Manbhum, *Campbell*, No. 8227! *Watt*, No. 8423! Damodar River, *Prain*! Kalikund, Sonthal Pergunnahs, *Gamble*, No. 10671! (5) North Bengal; Purneah, *Kurz*! Pabna, *Griffith*! Naogaon, *Prain*! (6) Central Bengal; Rajpore, *Kurz*! Faridpore, *C. B. Clarke*, No. 7480! Sibpur, *Gammie*! Midnapur, *Abdul Huk*!

VI.—NORTH-WEST HIMALAYA: *Royle*! (21) Garhwal; Mussoorie, *King*! (22) Kumaon, 1,000 ft., *Strachey & Winterbottom*, No. 25!

VIII.—EASTERN HIMALAYA: (1) Sikkim; *T. Anderson*!

IX.—ASSAM: No specimens from this sub-sub-area in the Calcutta Herbarium.

X.—BURMA: (6) Shan Hills; *Abdul Huk*, No. 11! (11) Irrawaddy Valley; Mandalay and Mengoon, *T. Anderson*! Prome, *Kurz*, No. 2213! Minbu district, *Gage*!

The writer is unable to refer any specimen in the Calcutta Herbarium to either VAR. *scabrinervis* or VAR. *macrantha*, as described in the *Flora of British India*.

31. Polygonum amphibium Linn.

VI.—NORTH-WEST HIMALAYA: (2) Baltistan; Iskardo Valley, 7,000 ft., *Strachey & Winterbottom*, No. 843! (12) Kashmir; Woolar Lake, 5,150 ft., *C. B. Clarke*, No. 29147 B! (22) Kumaon; Naini Tal Lake, *Madden*! *T. Anderson*!

VIII.—* EASTERN HIMALAYA: (2) Tibet; In a small lake near Chumbi, *King's collector*!

32. Polygonum lanigerum R. Br.

I.—* NORTH-WEST FRONTIER: (7) Rajputana; Abu, *King*!

IV.—Upper Gangetic Plain: Dehra Dun, *Duthie*, No. 1974!

V.—Bengal: (3) Tirhut; Kissengunge, *Kurz!* (5) North Bengal; Siliguri, *C. B. Clarke*, No. 26458! Titalya, *Kurz*! Banks of the Ganges near Sahibgunge, *Kurz*! (8) East Bengal; Jheels near Dacca, *Griffith*, No. 134!

VI.—North-West Himalaya: (20) Simla; Sirmoor, *Vicary*! (22) Kumaon; Bhim Tal, 4,400 ft., *Strachey & Winterbottom*, No. 15!

VII.—Nepal: *Wallich*, No. 1714-2.

VIII.—Eastern Himalaya: No specimens in Calcutta Herbarium.

IX.—Assam: (8) Brahmaputra Valley; Nowgong, *Simons*! Tezpur, *C. B. Clarke*, No. 37665!

X.—Burma: (6) Shan Hills; Chouchu, *Abdul Huk*, No. 67!

In the opinion of the writer, *Wallich*, No. 1717, is not a variety of this species, but is to be referred to *Polygonum lapathifolium* Linn. Wallich's sheet shows no more canescence than many examples of *Polygonum lapathifolium* from Burma and elsewhere, which show all stages from a quite evident tomentum on the lower surface of the leaves to leaves quite glabrous except for the scabrid midrib and margin; in its annual habit, its glandular peduncles and perianth, Wallich's plant in no way differs from *Polygonum lapathifolium* Linn.

33. Polygonum lapathifolium Linn.

I.—North-West Frontier: (1) Afghan border; Kurram Valley, *Aitchison*, No. 866! Peshawar, *Stewart*, No. 45! (2) British Baluchistan; Shalkot, *Duke*!

V.—Bengal: (5) North Bengal; Mahanuddi, *T. Thomson*! (6) Central Bengal; Faridpur, *C. B. Clarke*, No. 7515! Sibpur, *Kurz*!

VI.—North-West Himalaya: (1) Gilgit; *Giles*! Nittar Valley, 9-10,000 ft., *Duthie*, No. 12444! (9) Chitral and Dir; Dir, 5,600 ft., *Harris*, Duthie's No. 16582! (11) Hazara; Plains to 3,500 ft., *Stewart*, No 30! Kagan Valley, *Inayat*, Duthie's No. 20121! (22) Kumaon; Naini Tal, 6,500 ft., *Strachey & Winterbottom*, No. 17!

IX.—Assam: (8) Brahmaputra Valley; *Simons*! Makum Junction, *Chatterjee*!

X.—Burma: (6) Shan Hills; *Abdul Huk*, No. 10! Maymyo Hill, *Badal Khan*, No. 167! Fort Stedman, *King's collector*,

No. 530! Saga, Saikan, Taungyi, *Abdul Khalil*! (10) Irrawaddy Valley; *Wallich*, No. 1717! (11) Sittang Valley; *Kurz*, No. 517!

SUB-SP. **maculatum**

VI.—NORTH-WEST HIMALAYA: (2) Baltistan; Iskardo, 7-8,000 ft., *Duthie*, No. 12061! (5) Ladakh; Indus Valley from Upshi to Leh, 12-14,000 ft., *Stoliczka*! (12) Kashmir; Suroo to Sanko, *Stoliczka*! (21) Garhwal; Mussoorie, 7,000 ft., *King*!

The sub-species, which here represents the VAR. *nodosa* of the *Flora of British India*, might quite well be raised to specific rank as *Polygonum nodosum* Pers., a course which Forbes and Hemsley have taken in their *Enumeration of Chinese plants*. Judging from the Calcutta Herbarium specimens, the altitudinal range of the sub-species is strikingly different from the species proper, which would tend to support the view of their being specifically different.

34. Polygonum Persicaria Linn.

I.—NORTH-WEST FRONTIER: (1) Afghan border; Kurram Valley, *Harsukh*, Duthie's Nos. 15480 and 15481!

VI.—NORTH-WEST HIMALAYA: (1) Gilgit, 10,000 ft., *Giles* A., No. 51! (11) Hazara; Jaba, 3,700 ft., *Duthie*, No. 22126!

35. Polygonum minus Huds.

III.—PENINSULAR INDIA: *Wight*, K. D., No. 2459! (4) Nilgiri Hills; *Schmidt*! Kolahambi, 5,000 ft., *Gamble*, No. 16760! (9) Coimbatore, Madura, Tinnevelly; Pallangi, Pulney District, *Bourne*, No. 1150!

V.—BENGAL: *Griffith*, K. D., No. 4106 in part!

VI.—NORTH-WEST HIMALAYA: 12,000 ft., *T. Thomson*! (15) Kunawar and Bashahr; Ribba, 7,500 ft., *Lace*, No. 616! (21) Garhwal; Tons Valley, 3,000 ft., *Gamble*!

VII.—NEPAL: *Wallich*, 1722 A!

VIII.—EASTERN HIMALAYA: (1) Sikkim; Rili River, *Dungboo*!

IX.—ASSAM: (4) Khasia Hills, 2-3,000 ft., *Mann*, No. 419! (7) Manipur; Noung Shong Khong Valley, 3,900 ft., *Watt*, No. 6304! (8) Brahmaputra Valley; *Badal Khan*, No. 36! Dibrugarh 300 ft., *C. B. Clarke*, No. 37784! Gauhati, *King's collector*! Orang, *Shaik Mokim*, No. 61! (9) Sylhet; Companyganj, *C. B. Clarke*, No. 14347 A!

X.—Burma: (1) Chittagong District, *Herb. Ind. Or. H. f & T.*! (6) Shan Hills; Bhamo, *T. Anderson*!

XI.—Malay Peninsula: Pahang, *Ridley*, No. 1616!

36. Polygonum assamicum Meisn.

IX.—Assam: (4) Khasia Hills; *Herb. Ind. Or. H. f & T.*! (6) Naga Hills; *Prain*! (8) Brahmaputra Valley; *Mann*, No. 405! Upper Dihing River, Lakhimpur District, *Mann*, No. 529!

37. Polygonum viscosum Ham.

VII.—Nepal: *Wallich*, No. 1713 A!

IX.—Assam: (4) Khasia Hills; *Herb. Ind. Or. H. f & T.*! *Oldham*! (6) Naga Hills; Jaboca, *Prain's collector*, No. 734! (8) Brahmaputra Valley; *Mann*, No. 139! Dibrugarh; *A. C. Chatterjee*! Goalpara; *Fisher*! (9) Sylhet; *C. B. Clarke*, No. 18133 B! Phenchoogunj, *C. B. Clarke*, No. 6968!

X.—* Burma: (1) Chittagong District; *King's collector*, No. 310! (6) Shan Hills; Fort Stedman, *Abdul Huk*!

38. Polygonum stagninum Ham.

V.—Bengal: (2) Chutia Nagpur; Basia, 2,000 ft., *C. B. Clarke*, No. 33942! (5) North Bengal; banks of Panar River, and banks of the Ganges near Sahibgunj, *Kurz*! Caragola, *C. B. Clarke*, No. 11743! (8) East Bengal; Dacca, *C. B. Clarke*, Nos. 7106 B and 7406! Ramgopalpore, Mymensingh District, *C. B. Clarke*, No. 17240 E!

VI.—North-West Himalaya: (18) Chamba; 3,000 ft., *C. B. Clarke*, Nos. 24344 and 24348! (22) Kumaon; below Almora, 5,500 ft, *Strachey & Winterbottom*, No. 19!

IX.—Assam: (4) Khasia, Hills; 1-2,000 ft., *Mann*! (8) Brahmaputra Valley; *Fisher*! Sibsagar, 250 ft., *C. B. Clarke*, No. 38026 B.! (1) Sylhet; Kurrimgunj, *C. B. Clarke*, No. 6993!

X.—Burma: (11) Sittang Valley; *Kurz*, Nos. 528 and 529!

39. Polygonum barbatum Linn.

I.—North-West Frontier: (1) Afghanistan; *Griffith*, K. D., No. 4115! (6) Punjab, east of the Sutlej; *Griffith*! (7) Rajputana; Abu, *Duthie*, No. 6704!

II.—Central Provinces: Saugor, *Vicary*! Khandwa, *Duthie*, No. 8402! Chanda Distric, *Duthie*, Nos. 9712 and 9713!

III.—Peninsular India: *G. Thomson*! *Wight*, K. D., No. 2454! (5) Travancore; *Lawson*, No. 159!

IV.—Upper Gangetic Plain: Dehra Dun, *Vicary*!

V.—Bengal: (2) Chutia Nagpur; Ranchi, 1,500 ft., *C. B. Clarke*, No. 21360! Domree, Hazaribagh, 1,000 ft., *C. B. Clarke*, No. 33862 A! Palamow, *Gamble*, No. 8795! Bokaro River, *Prain*! Parasnath, *T. Thomson*! (5) North Bengal, *T. Anderson*! (6) Central Bengal; Sibpur, *Gammie*!

VI.—North-West Himalaya: *Royle*! (22) Kumaon, *Wallich*, No. 1708 A!

VII.—Nepal: *Buchanan-Hamilton*!

VIII.—Eastern Himalaya: (1) Darjeeling District, 2,000 ft., *King*! (2) Bhutan, *Dungboo*!

IX.—Assam: (4) Khasia Hills; *Herb. Kurz*! (6) Naga Hills; *Prain*! (8) Brahmaputra Valley, *Jenkins*!

X.—Burma: (2) Lushai Hills; Changsil, *Prazer*! (6) Shan Hills; Bhamo, *T. Anderson*! Indine and Saga, *Abdul Khalil*! Meingyan, *Abdul Huk*! Maymyo Hill, *Badal Khan*, No. 98! Makhaye Hill, *King's collector*! (7) Pegu Yomah; Myodwine River, *Kurz*, No. 527! Pansway, *Kurz*, No. 528! (9) Arracan; Akyab, *Kurz*, No. 528! (11) Sittang Valley; Tonkyeghat, *Kurz*, No. 528! (12) Tenasserim; Moulmein, *Falconer*, No. 324! Martaban, *Kurz*, No. 528!

XI.—Malay Peninsula and Andamans: (1) Malay Peninsula; Malacca, *Griffith*! Singapore, *Hullett*, No. 10! *Ridley*, Nos. 1604 and 3756! Penang, *Curtis*, No. 2785! Perak, *Curtis*, No. 3179! (2) Andamans; Port Mouat, *King's collector*! Anikhet and Bajajagdah Hill, South Andaman; *King's collector*! Table Island, *Prain*!

Were it not that it is the writer's purpose in this paper to follow the *Flora of British India* as far as possible, he would certainly consider *P. stagninum* and *P. barbatum* as one species, placing *P. stagninum* as a variety of *P. barbatum*. The difference between the two is merely a matter of more or less tomentum. The plants with thickly silkily strigose leaves and branches have invariably the pubescence extending on to the bracts, the plants which are almost glabrous or show only a very moderate amount of scabridity have always glabrous bracts. The writer has in vain attempted to lay hold of any more satisfactory character. Accordingly all the plants with hairy bracts have been

lumped together as *P. stagninum* Ham., and all those with glabrous bracts as *P. barbatum* Linn. *P. serrulatum* Lagasc., which has also glabrous bracts, is distinguished from *P. barbatum* by its narrower, more linear-looking, and almost always glabrous leaves with a slightly cordate base or if not cordate at least never cuneate as in *P. barbatum*. The leaves of *P. serrulatum* when dry are rather green in colour, those of *P. barbatum* dark-brown. With regard to the note under *Polygonum stagninum* in the *Flora of British India*, it may be of interest to record here that, in the Calcutta Herbarium, there is a sheet of undoubted *Polygonum barbatum* Linn., which is labelled *P. hispidum*, and has a short latin description appended, both name and description being in Buchanan-Hamilton's own handwriting. The occurrence of this sheet certainly supports Meisner's reference of Hamilton's *Polygonum hispidum* to *Polygonum barbatum* Linn. The *Polygonum barbatum* of Roxburgh's unpublished *Icones* is not *Polygonum tomentosum* Willd., which has short racemes and an orbicular nut and is well represented under its proper name amongst the *Icones*. The *Polygonum barbatum* of Roxburgh's *Icones* is an excellent representation of *Polygonum macranthum* Meisn., which is also well described as *Polygonum barbatum* in his *Flora Indica*, where the reference to the twiggy racemes, so characteristic of *Polygonum macranthum* Meisn., is unmistakeable.

It may not be superfluous to give here the writer's identification of all Roxburgh's drawings of *Polygonums* in the *Icon. Ined.*, vol. vii :—

Name on Roxburgh's drawing.		Name under which now known.
104. Polygonum nutans . . .	*R* 1135 =	Polygonum lapathifolium *Linn.*
105. Polygonum lanatum . . .	*R* 939 =	Polygonum lanigerum *Br.*
106. Polygonum pilosum . . .	*R* 934 =	Polygonum orientale *Linn.*
107. Polygonum tomentosum . .	628 =	Polygonum tomentosum *Willd.*
108. Polygonum glabrum . . .	629 =	Polygonum glabrum *Willd.*
109. Polygonum tenellum . . .	*R* 1134 =	? Polygonum flaccidum *Meisn.*
110. Polygonum barbatum . . .	631 =	Polygonum macranthum *Meisn.*
111. Polygonum rivulare . . .	630 =	Polygonum barbatum *Linn.*
112. Polygonum flaccidum . . .	*R* 1056 =	Polygonum serrulatum *Lagasc.*
113. Polygonum perfoliatum . .	1412 =	Polygonum perfoliatum *Linn.*
114. Polygonum elegans *Sol. Mss.* .	632 =	Polygonum plebejum *R. Br.* var. indica of *F. B. I.*

40. Polygonum serrulatum Lagasc.

I.—North-West Frontier: (1) Afghan border; Peshawar, *Stewart*, No. 149! Dera Ismail Khan, *Harsukh*, Duthie's No. 15733! (2) British Baluchistan; Quetta, *Hamilton*! (3) Indore; Goona, *King*, No. 85!

III.—Peninsular India: *Talbot*, No. 3140!

IV.—Upper Gangetic Plain: (1) Rohilcund, Agra and Oudh; Dehra Dun, *King*! Forests of North Oudh, *R. Thompson*! Lucknow, *Bonavia*, No. 62! Banks of the Gumpti near Indalpur, *Duthie*, No. 4355! (2) Bundelcund; *Vicary*!

V.—Bengal: (6) Central Bengal; Howrah, *T. Anderson*! Sibpur, *Kurz*! (8) East Bengal; *Unknown collector*!

VI.—North-West Himalaya: (21) Garhwal; Deoban, 8,000 ft., *Rogers*! Mussoorie, *Duthie*, No. 570! (22) Kumaon; Naini Tal, *T. Anderson*!

X.—Burma: (1) Chittagong District; Rangamatti, *C. B. Clarke* No. 8291! (6) Shan Hills; *Abdul Huk*, No. 33! Fort Stedman, *Abdul Huk*! Kumay Road, *Abdul Huk*, No. 97! Makhaye Hill, *King's collector*! Maymyo Hill, near Mandalay, *Badal Khan*, Nos. 97 and 163! Monay, *Abdul Khalil*!

XI.—Malay Peninsula and Andamans: Nicobar Islands; Katchall, *Kurz*!

The writer has failed to identify the variety *Donii* in the Calcutta Herbarium.

41. Polygonum Posumbu Ham.

IV.—Upper Gangetic Plain: Dehra Dun, 2,000 ft., *King*!

VI.—North-West Himalaya: (12) Kashmir; Gulmarg, 9-10,000 ft., *Duthie*! (19) Kangra; *Edgeworth*! (20) Simla; Sirmoor, *Vicary*! (22) Kumaon; Hurrara, 4,000 ft., *Strachey & Winterbottom*, No. 18!

VIII.—Eastern Himalaya: (1) Sikkim; Kajell, *T. Anderson*! Little Rungeet, *T. Thomson*! Great Rungeet, *Kurz*! *T. Anderson*, No. 234! Ratong to Yoksum, 2,500 to 5,000 ft., *T. Anderson*, No. 1186! Soke, 3,000 ft., *C. B. Clarke*, No. 24902 B! Rishap, 4,000 ft., *C. B. Clarke*, No. 13584 C! Sureil, 5,000 ft., *King*! *Gage*! (2) Tibet and Bhutan; Shong-ong-la, 8,000 ft., *Dungboo*!

IX.—Assam: (1) Daphla Hills; Dikrung Valley, *Lister*! (4) Khasia Hills; *Herb. Ind. Or. H. f. & T.*! (6) Naga Hills; Tingali Bam, *Prain's collector*, No. 178! (8) Brahmaputra Valley; Dibrugarh, 300 ft., *C. B. Clarke*, No. 37743 A! Golaghat; Sibsagar, 300 ft., *C. B. Clarke*, No. 40750!

42. *Polygonum mite Schrank. (*Bair. Fl, 1. 688*).

Annual, sub-erect; branches glabrous. *Leaves* very shortly petioled, arising from the base of the stipular tube, lamina 2·5 cm. to 5·5 cm

long, lanceolate, acute, glabrous or with a few scattered hairs on both surfaces, especially on the midrib, margins ciliolate. *Stipules* with scattered adpressed strigose hairs and cilia as long as the tube. Floriferous portion of raceme 1·3 to 3 cm. long, loose, interrupted; peduncles glabrous, with stout cilia; *perianth* glabrous; *nutlet* small black, plano-convex or trigonous.

VI.—North-West Himalaya: (12) Kashmir; near Gulmarg, 8-9,000 ft., *Duthie*! Khairpore, Kashmir Valley, 6,000 ft., *Gammie*! (15) Kunawar; Pangi, *Stoliczka*! (18) Chamba; Dalhousie, 7,000 ft., *C. B. Clarke*, No. 22299B! Between Alwas and Tisa, 4,000 ft., *Gammie*, No. 18428! (19) Kulu; Beas Valley from Bijaura to the base of the Rottang Pass, 4-6,500 ft., *Stoliczka*! (20) Simla; *Duthie*, Nos. 8817 and 10084! *Inayat*, No. 8814! (21) Garhwal; Mussoorie, 7,000 ft., *King*! *Duthie*, No. 744!

43. Polygonum Hydropiper Linn.

I.—North-West Frontier: (1) Afghan border; Hango, 3,200 ft., *Inayat*, Duthie's No. 20928! Ushtarzai, 1,800 ft., *Inayat*, Duthie's No. 20930!

V.—Bengal: (2) Chutia Nagpur; Damodar River, *Prain*! (5) North Bengal; Purneah, *Kurz*! (6) Central Bengal; Sibpur, *Kurz*! (7) West Bengal, near Ranigunge, *Kurz*!

VI.—North-West Himalaya: (1) Gilgit; *Strachey & Winterbottom*, No. 985! *Giles*, No. 272! (10) Swat Valley; Chakdara, *Harriss*, Duthie's No. 16585! (18) Chamba; Chamba to Masrund, 3,000 ft., *Lace*, No. 1834! (22) Kumaon, *King*! Bagesar, 3,200 ft., *Strachey & Winterbottom*, No. 16!

VIII.—Eastern Himalaya: (1) Darjeeling District; Darjeeling, 6,000 ft., *Lister*! Sureil, 5,000 ft., *Gage*!

IX.—Assam: (4) Khasia Hills; 4-6,000 ft., *Mann*, Nos. 237 and 623! (6) Naga Hills; Kohima, 3-4,000 ft., *Prain*! Shillong, *Prain*, No. 57! (8) Brahmaputra Valley; Gauhati, *King's collector*! Jala Busti, near Teock Ghat, *Prain's collector*!

VAR. ***glandulosissima.**

III.—Peninsular India: (2) North Canara; *Talbot*, No. 2682! Near Hubli, Dharwar District, *College of Science, Poona*! Covered everywhere with numerous minute glands, everywhere perfectly glabrous and eciliate.

44. Polygonum flaccidum Meisn.

I.—NORTH-WEST FRONTIER: (1) Afghan border; Peshawar, *Stewart*, No. 223! (5) Punjab, west of the Sutlej; Rawal Pindi. *Aitchison*, No. 1009!

III.—PENINSULAR INDIA: *Wight*, K. D., No. 2453! (4) Nilgiris, *G. Thomson*!

IV.—UPPER GANGETIC PLAIN: Dehra Dun, *King*!

V.—BENGAL: (2) Chutia Nagpur; Koshang, Singbhum, 2,000 ft., *Gamble*, No. 8993! (5) North Bengal; below Siliguri, *Kurz*! (6) Central Bengal; Jessore, *Parry*! Rajpore, *Kurz*! Badoorea, 24-Pergunnahs, *C. B. Clarke*, No. 34857 A! Sibpur, *Gammie*!

VI.—NORTH-WEST HIMALAYA: (18) Chamba, 3,000 ft., *C. B. Clarke*, No. 24273 A! Dalhousie, 7,000 ft., *Grant*! *C. B. Clarke*, No. 23131C! (22) Kumaon; Small lake near Bhim Tal, 4-5,000 ft., *Duthie*, No. 4354! Near Ranikhet, 5-6,000 ft., No 5936!

VIII.—EASTERN HIMALAYA: (1) Darjeeling District; Rungbee, 5,000 ft., *Gamble*, No. 2692C! Rishap, 3,000 ft., *C. B. Clarke*, No. 12572 B! Mungpoo, 3,000 ft., *C. B. Clarke*, No. 26748 A! (2) Bhutan, *Parkes*!

IX.—ASSAM: (6) Naga Hills; Kohima, *Prain*! *C. B. Clarke*, No. 41704! Shillong, 5,000 ft., *C. B. Clarke*, Nos. 40329 A and 44681 A! (8) Brahmaputra Valley; Dikho Valley, *Watt*, No. 10349! Jorhat, Sibsagar, 250 ft., *C. B. Clarke*, No. 38044 F! Sibsagar, *Watt*, No. 10373! Teock Ghat, near Tingali Bam, *Prain's collector*, No. 338!

X.—BURMA: (1) Chittagong Hill Tracts; *King's collector*, No. 197! (3) Chin Hills; *Abdul Huk*! (6) Shan Hills; Bhamo, *J. Anderson*! (11) Sittang Valley, *Kurz*, No. 524!

XI.—MALAY PENINSULA: Kintra River, *King's collector*, No. 809! Larut, *Kunstler*, No. 2503! Perak, *Ridley*, No. 2964! Pahang, *Ridley*, No. 1335!

VAR. hispida.

III.—PENINSULAR INDIA: (4) Nilgiris, *G. Thomson*! (7) Northern Circars; Dohu Ghat, Ganjam District, 2,500 ft., *Gamble*, No. 1366!

V.—BENGAL: (8) East Bengal; Dacca, *C. B. Clarke*, No. 8143!

VI.—North-West Himalaya: (21) Garhwal; Lobah, 5-6,000 ft., *Duthie*, No. 4350!

VII.—Nepal: Ramebund, *Wallich*, No. 1723 A in part!

VIII.—Eastern Himalaya: *T. Thomson*! (1) Darjeeling District, *Kurz*!

X.—Burma: (6) Shan Hills, *Abdul Huk*! (7) Pegu Yomah; Phoungee, *Kurz*, No. 524! (11) Sittang Valley; Tonghoo, *Kurz*, No. 523! Pegu, *Brandis*, No. 1399! (12) Tenasserim, *Helfer*, K. D., No. 4133!

The Wallichian sheet 1723A in the Calcutta Herbarium contains two plants of *Polygonum serrulatum* Lagasc., and one indifferent specimen of *Polygonum flaccidum* var. *hispida*. The mixture is labelled *Polygonum hispidum* Hamilt. *apud* Don, *Prodr. Napal. Legi in Napalia ad Ramebund, Aug.* 1821. As explained under *Polygonum barbatum*, the evidence appears to the writer to be in favour of referring *Polygonum hispidum* Ham., to *Polygonum barbatum* Linn.

The description in Don's *Prodromus* is vague enough but appears to the writer to fit *Polygonum barbatum* better than *Polygonum flaccidum* var. *hispida*: the term *spicis densifloris*' could scarcely be applied correctly to the latter.

45. Polygonum macranthum Meisn. P. barbatum *Roxb.*

IX.—Assam: *Griffith*, K. D., No. 4109! *Lister*! (4) Khasia Hills; *Hooker f. & Thomson*, No. 21! Soyung, 5,000 ft., *C. B. Clarke*, Nos. 44720 A and 45412 C!

All the above-quoted specimens show minute glands both on perianth and bracts.

Section VIII.—Cephalophilon Meisn.

46. Polygonum humile Meisn.

VI.—North-West Himalaya: (22) Kumaon; Ralum, 8,500 ft., *Strachey & Winterbottom*, No. 45! Gori Valley above Munshiari, 6-7,000 ft., *Duthie*, No. 3334!

47. Polygonum glaciale Hook. fil.

I.—North-West Frontier: (1) Afghan border; Sikaram, 12,000 ft., Kurram Valley, *Aitchison*, No. 1203!

VI.—North-West Himalaya: (12) Kashmir; above Kilam, 12,000 ft., *Aitchison*! Tilail, 12,000 ft., *C. B. Clarke*, No. 30800B! (22) Kumaon; Milam Glacier, 12,500 ft.

Strachey & Winterbottom, No. 44! Near Bhidang in the Dhauli Valley, Darma, 13-14,000 ft., *Duthie*, No. 3350!

48. Polygonum alatum Ham.

I.—NORTH-WEST FRONTIER: (1) Afghan border; Kurram Valley, *Aitchison*, No. 986!

III.—PENINSULAR INDIA: (4) Nilgiris; *Schmidt*! Ootacamund, 7,000 ft., *King*! *Gamble*, No. 15353! (9) Madura; Kodaikanal Lake, *Bourne*, No. 695! (10) Mysore; Bababuden Hills, *Talbot*, Nos. 2369 and 2988!

IV.—UPPER GANGETIC PLAIN: Dehra Dun, 2,000 ft., *Duthie*!

V.—BENGAL: (2) Chutia Nagpur; Parasnath, *T. Thomson*! *Kurz*!

VI.—NORTH-WEST HIMALAYA: (1) Gilgit; Jindrote, 7,500 ft., *Giles*, No. A 24! (9) Chitral; Mirga, *Harris*, *Gatacre*, Duthie's Nos. 16580, 17510, 17511! (11) Hazara; *Stewart*, No. 571! *Schlagintweit*, No. 6409! Kagan Valley, 9,000 ft., *Inayat*, Duthie's No. 20125! Kahi Galli, 8,000 ft., *Duthie*, No. 7562! (12) Kashmir; Suru, *Stoliczka*! Sonamurg, 8-9,000 ft., *Duthie*, No. 11502! Pir Panjal, 9,000 ft., *Gammie*! (13) Kistawar; Badrawar, 4-10,000 ft., *Stoliczka*! (15) Kunawar; Bashahr, 9,200 ft., *Lace*, No. 495! (18) Chamba; Dalhousie, 7,000 ft, *Clark*, Nos. 135 and 136! *C. B. Clarke*, No. 22114 B! (20) Simla; Sirmoor, *Vicary*! Simla, 7,000 ft., *Hawkes*! *Gamble*, No. 5161 C! (21) Garhwal; Mussoorie, 7,000 ft., *King*! (22) Kumaon; near Tola, 11,500 ft., *Strachey & Winterbottom*, No. 9! Naini Tal, 7,000 ft., *Strachey & Winterbottom*, No. 9! *Hume*!

VII.—NEPAL: *Wallich*, No. 1701-1.

VIII.—EASTERN HIMALAYA: (1) Sikkim; Punkabari, *Kurz*! Rungno Valley, *Kurz*! Lebong, *T. Thomson*! Mungpoo, 3,500 ft., *Gammie*! Little Rungeet, *Kurz*! *T. Anderson*, No. 239! Senchal, 8,000 ft., *Gamble*, No. 2699 A! Tonglo, 10,000 ft., *King's collector*! Lachung Valley, 8,500-13,000 ft., *Gammie*, Nos. 938 and 1057! (2) Tibet and Bhutan; *King's collector*!

IX.—ASSAM: (4) Khasia Hills; *Mann*, Nos. 397 and 1136! Shillong, 5,000 ft., *Prain*! *C. B. Clarke*, No. 17680 B! (6) Naga Hills; Kohima, 4,750 ft., *C. B. Clarke*, No. 41638! (7) Manipur; Mao to Kegnin, 6,000 ft., *Watt*, No. 685!

X.—BURMA: (2) South Lushai Hills; 15 miles south-east of Fort Lungleh, 3,000 ft., *Gage*, No. 163! (3) Chin Hills; *Abdul Huk*! (5) Kachin Hills; *Shaik Mokim*! (6) Shan Hills; Maymyo Hill, 40 miles from Mandalay, *Badal Khan*, No. 264! Fort Stedman, *Abdul Huk*! (12) Tenasserim; Martaban, *Kurz*, No. 515!

VAR. **Metziana.**

III.—PENINSULAR INDIA: (4) Nilgiri Hills; *Schmidt*!

V.—BENGAL: (2) Chutia Nagpur; Parasnath, *T. Thomson*!

VI.—NORTH-WEST HIMALAYA: (13) Kistawar; Badrawar, 8,000 ft., *C. B. Clarke*, No. 31468B! (18) Chamba; Dalhousie, 5,000 ft., *C. B. Clarke*, No. 23184 B! (20) Simla; North-east of Simla, *Stoliczka*! (21) Garhwal; *King*! (22) Kumaon; Raniket, 6,000 ft., *Duthie*, No. 4344 A!

VIII.—EASTERN HIMALAYA: (1) Sikkim; *T. Anderson*! *Kurz*! Top of Phalut, 10,000 ft, *T. Thomson*!

IX.—ASSAM: (4) Khasia Hills; *Mann*, No. 627! Shillong, *Collett*! Madkadokadok, 5,000 ft., *C. B. Clarke*, Nos. 40411 A and 45367 A! Cherrapunji, 5,000 ft., *Gallatly*, No. 221!

VAR. **parviflora.**

VI.—NORTH-WEST HIMALAYA: (22) Kumaon; Naini Tal, 7,000 ft, *Strachey & Winterbottom*, No. 11!

VII.—NEPAL: *Wallich*, No. 1700!

IX.—ASSAM: (4) Khasia Hills; Dingling, 3,500 ft., *C. B. Clarke*, No. 13078 A! Maolingkaden, 4,000 ft., *C. B. Clarke*, No. 44810! Shillong, 5,500 ft., *C. B. Clarke*, No. 38850 A!

VAR. **tenuicaulis.**

IX.—ASSAM: (4) Khasia Hills; *Mann.*! Mairung, 5,000 ft., *C. B. Clarke*, No. 16152! Maokadokadok, 5,500 ft., *C. B. Clarke*, No. 45371 B!

The varieties *arenaria* and *rigidula* are not represented in the Calcutta Herbarium. The writer has failed to recognise amongst the Calcutta sheets the var. *nepalensis* as distinct from *Polygonum alatum* proper. Of the list of sheets quoted under *Polygonum alatum*, only Duthie's No. 17511 from Mirga, Chitral, has trigonous nutlets; it differs in no other particular from the rest of the sheets.

49. Polygonum microcephalum Don.

VII.—NEPAL: *Wallich.*

VIII.—EASTERN HIMALAYA: (1) Sikkim and Darjeeling District; *King*, No. 24! Sivoke, *T. Anderson*! *Kurz*! Tonglo,

T. Thomson! Punkabari, *Kurz*! Ryang, 4,000 ft., *C. B. Clarke*, No. 13645! *King*! Sittang, 3,000 ft., Sureil, 5,000 ft., *Gage*! (2) Bhutan; *Parkes*!

IX.—ASSAM: (4) Khasia Hills; 250-5,000 ft., *C. B. Clarke*, No. 5413! (6) Naga Hills; Chedama stream, 4-6,000 ft., *Prain*! Kohima, 3,000 ft., *Prain*! (8) Brahmaputra Valley; Sibsagar, *Masters*! (9) Sylhet, *Wallich*, No. 1704 E!

50. Polygonum Wallichii Meisn.

VII.—NEPAL: *Wallich*, No. 1702 A! *Scully*, No. 61!

51. Polygonum sphærocephalum Wall.

VI.—NORTH-WEST HIMALAYA: (18) Chamba; *Lace*, No. 1768! (21) Garhwal; *Gollan*, No. 1982! Jaunsar, 8,500 ft., *Gamble*, Nos. 24868 and 26787! (22) Kumaon; Kathi, 7,800 ft., *Strachey & Winterbottom*, No. 10! Dhankiri, 8,000 ft., *Collett*! Forest above Shinkala, 9-10,000 ft., *Duthie*, No. 5931!

VII.—NEPAL: *Wallich*, No. 1703!

Distributed to CENTRAL CHINA: Hupeh; *Henry*, No. 6075! This sheet of Henry's has been identified, in the writer's opinion, wrongly by Forbes and Hemsley as *Polygonum runcinatum* Ham., from which it differs in the venation of the leaf, in the absence of any sign of runcination and in being non-auriculate.

52. Polygonum runcinatum Ham.

III.—PENINSULAR INDIA: (4) *Nilgiris; Ootacamund, 7,500 ft., *Gamble*, No. 12701! This is the same plant as is figured in Wight, *Icones Pl.* t. 1805.

VII.—NEPAL: *Wallich*, No. 1698!

VIII—EASTERN HIMALAYA: (1) Sikkim; Darjeeling, 7,000 ft., *C. B. Clarke*, Nos. 8967 B and 12205 C! *Gamble*, No. 2687 B! Rungno and Little Rungeet Valleys, *Kurz*! Rungeet Valley, *T. Anderson*, No. 236! Old Lebong Road, *T. Thomson*! Sureil, 5,000 ft., *King*! Tukvar, *T. Thomson*! Phalut, 10,000 ft., *T. Thomson*! Tongloo, 8-10,000 ft., *T. Thomson*! *T. Anderson*, Nos. 1123 and 1132! *King*, No. 3094! *Gamble*, Nos. 2695 E., 9447, and 10435! Singalelah, 11,000 ft., *Gammie*, No. 76! (2) Tibet, *King's collector*!

IX.—ASSAM: (4) Khasia Hills; Mairung, 55,00 ft., *C. B. Clarke*, No. 40258 A! Cherra Plateau, 4,000 ft., *C. B. Clarke*, No. 5551! (6) Naga Hills; Kohima, 4,750 ft., *C. B. Clarke*, No 41631!

53. Polygonum sinuatum Royle.

VI.—NORTH-WEST HIMALAYA: (15) Kunawar and Bashahr; *Vicary*! Harang, 10,000 ft., *Brandis*, No. 3554! (21) Garhwal; side of stream above Jalla, Ganges Valley, 10-11,000 ft., *Duthie*, No. 1984! (22) Kumaon; descent to Saba, 8,500 ft., and Ralum River, 9-10,000 ft., *Strachey & Winterbottom*, No. 40!

VIII.—*EASTERN HIMALAYA: (1) Sikkim; Lachung Valley, 10,000 ft., *Gammie*, No. 739!

54. Polygonum capitatum Ham.

V.—*BENGAL: (2) Chutia Nagpur; Manbhum, *Campbell*, Watt's No. 9474!

VI.—NORTH-WEST HIMALAYA: (15) Kunawar and Bashahr; Kandrard Gad, *Lace*, No. 872! (18) Chamba; Rakh to Chamba, 3-5,000 ft., *Lace*, No. 1772! Dalhousie, 5-7,000 ft., *Clark*, No. 133! *C. B. Clarke*, Nos. 22111 and 23149 B! (19) Kulu; Beas Valley from Bijaura to the base of the Rottang Pass, 4-6,500 ft., *Stoliczka*! (20) Simla; Sirmoor, *Vicary*! Simla, *Schlich*! Jheog, 7,000 ft., *Gamble*, No. 4367 B! Tara Devi, 6,500 ft., *Gamble*, No. 5642 B! (21) Garhwal; Landour, *Vicary*! Mussoorie, *King*! Near Dhunda in the Ganges Valley, 4-5,000 ft., *Duthie*, No. 202! Jumna Valley, Kharsali, 8-9,000 ft., *Duthie*, No. 535! (22) Kumaon; *Wallich*, 1699 B! Naini Tal and Almora, 5,500 ft., *Strachey & Winterbottom*, No. 8! Naini Tal, 7,000 ft., *Hume*!

VII.—NEPAL: *Maries*! *Scully*, No. 326!

VIII.—EASTERN HIMALAYA: (1) Darjeeling District and Sikkim; Darjeeling, 7,000 ft., *Kurz*! *T. Anderson*, No. 235! Sureil, 5,000 ft., *Gage*! Punkabari, *Kurz*! Lingdam, 4,000 ft., *C. B. Clarke*, No. 13084 C! Gorh, 3,500 ft., and Namdee, 10,000 ft., *King's collector*!

IX.—ASSAM: (2) Mishmi Hills; *Griffith*! (4) Khasia Hills; *Griffith*, No. 739! *Mann*, Nos. 532 and 578! Cherrapunji, *Gallatly*, No. 197! Cherra Plateau, 4,500 ft., *C. B. Clarke*, No. 5134! Borpani, 3,000 ft., *C. B.*

Clarke, No. 38196 A! Kullong, 5,800 ft., *C. B. Clarke*, No. 40010 B! Shillong, *Prain*! *Badal Khan*! (6) Naga Hills; Kohima, 4,750 ft., *C. B. Clarke*, No. 41700! *Prain*! Mongoemdi Road, *Watt*, No. 11810! (7) Manipur; *Watt*, No. 7407! Mao, 5,800 ft., *Watt*, No. 6129! (9) Sylhet; *Wallich*, No. 1699 C!

55. Polygonum chinense Linn.

IX.—ASSAM: (2) Mishmi Hills; *Griffith*! (6) Naga Hills; Kohima, *Prain*! Jaboca, *Prain's collector*, No. 135! (8) Brahmaputra Valley; Nowgong, *Simons*! (9) Sylhet and Cachar; *Wallich*, No. 1707 A! *Keenan*!

X.—BURMA: (1) Chittagong Hill Tracts; *King's collector*, Nos. 91, 153, 197, 243, 292, 626, 656! (6) Shan Hills; *Abdul Huk*! Bhamo; *J. Anderson*! (7) Pegu Yomah; *Kurz*, Nos. 521 and 2211! (11) Sittang Valley; Toukyeghat, *Kurz*, No. 521!

XI.—MALAY PENINSULA: Perak; *Scortechini*!

VAR. **scabra.**

IX.—ASSAM: (4) Khasia Hills; *Griffith*! (6) Naga Hills; Kohima, 4,750 ft., *C. B. Clarke*, No. 41615!

X.—BURMA: (5) Kachin Hills; *Pottinger*! (6) Shan Hills; Pewhla, *Prazer*! Maymyo Hill, *King's collector*, Nos. 122, 164! (12) Tenasserim; Paratoba, 2,500 ft., *Gallatly*, No. 175!

VAR. **ovalifolia.**

III.—PENINSULAR INDIA: (1) Concan; Mahableshwar, *T. Cooke*! (4) Nilgiris, 6,500 ft., *Gamble*, No. 11728! Pykara, *King*! Ootacamund, *Schmidt*! *King*! (5) Travancore; High Range, *Ferguson*, Bourdillon's No. 7! (8) Carnatic; Shevaroi Hills; *Perottet*, No. 22! (9) Madura; Kodaikanal, Pulney Hills, *Bourne*!

V.—BENGAL: (2) Chutia Nagpur; Parasnath, 4,200 ft., *C. B. Clarke*, No. 33730! *T. Thomson*! *Kurz*! Manbhum, *Campbell*, Watt's No. 8257!

VI.—NORTH-WEST HIMALAYA: (22) Kumaon; Durgara, and Naini Tal; *Strachey & Winterbottom*, No. 36!

VII.—NEPAL: *Maries*! *Wallich*, No. 1705 A!

VIII.—EASTERN HIMALAYA: (1) Sikkim and Darjeeling District; *King*, No. 963! Tonglo, 7,000 ft., *T. Thomson*! Yoksum, 4,500 ft., *T. Anderson*, No. 1151! Rungbee, *C. B.*

Clarke, No. 8678! (2) Tibet and Bhutan; *Parkes*! *King's collector*!

IX.—ASSAM: (4) Khasia Hills; *Griffith*! *Hooker & Thomson*! *Mann*! (7) Manipur; on the way to Singli, *Watt*, No. 6692!

X.—BURMA: (5) Kachin Hills; *Pottinger*! (7) Shan and Karen, Hills; Shway Koo, *J. Anderson*! Pwehla, 4,000 ft. *Collett*! Nantuphit Valley, 5,200 ft, *Gatacre*! Ruby Mines, *Abdul Huk*, No. 105! Makhaye Hill, and Madoe Hill, *King's collector*! Fort Stedman, *Abdul Huk*! Indine, Saga and Taungyi, *Abdul Khalil*! Natoung Mountains, *Cross*, Nos. 39 and 40! *Kurz*, No. 522!

X.—MALAY PENINSULA: *Kunstler*, No. 7968!

VAR. **subhastata.**

IX.—ASSAM: (7) Manipur; *Watt*, Nos. 5172 and 7406! (8) Brahmaputra Valley; Dibrugarh, *King's collector*, No. 37! Gauhati, *Gill*, No. 18! Teopora, *Watt*, No. 11131!

X.—BURMA: (2) Lushai Hills; Fort Lungleh, 3,000 ft., *Gage*, No. 52!

VAR. **brachiata.**

IX.—ASSAM: (1) Daphla Hills; Dikrung, 2,000 ft., *Lister*, No. 19! (2) Mishmi Hills; *Griffith*! (3) Garo Hills; *Mann*! (4) Khasia Hills; *Griffith*, No. 562! *Mann*, No. 599! (6) Naga Hills; Pherima, *Collett*! Tingali Bam, *Prain's collector*, No. 429! (9) Sylhet and Cachar; Lukhipur, Cachar, *C. B. Clarke*, No. 7029! Barak, Cachar, *Prazer*!

VAR. **corymbosa.**

VI.—NORTH-WEST HIMALAYA: (20) Simla; Sirmoor, *Vicary*! *Gamble*, Nos. 4461 B and 5484 B! (21) Garhwal; Chakrata, 7,000 ft., *Gamble*, No. 26905! Ganges Valley, between Betwari and Dangulha, 5-6,000 ft, *Duthie*, No. 1992! Lobah, 5-6,000 ft., *Duthie*, No. 4348! Nag Tiba, near Mussoorie, 9-10,000 ft, *Duthie*! Mussoorie, *King*! (22) Kumaon; Valley of the Gori, 7,000 ft., *Strachey & Winterbottom*, No. 36½.

VII.—NEPAL: *Wallich*, 1706-1! *Scully*, No. 5!

VIII.—EASTERN HIMALAYA: *Hooker fil.*! *Kurz*! (1) Sikkim; Darjeeling, 7,000 ft., *Gamble*, No. 2710 B! Senchal, 8,000 ft., *T. Thomson*!

IX.—ASSAM: (4) Khasia Hills, *Kurz*! *Mann*, Nos. 283 and 344! (6) Naga Hills; Konoma, *Prain*!

The separating out of the varieties of this species is by no means easy, and in the writer's opinion too much reliance may be placed on the presence or absence of glands on the peduncles as varietal distinctions. It is not always possible to distinguish between a "hispidulous" peduncle and one from which the gland heads have dropped off the gland stalks, and in many apparently "hispidulous" peduncles the writer has detected a small proportion of glandular heads still remaining and showing the true character of the peduncle. The confusion which inattention to this resemblance between a truly hispidulous peduncle and one that is only apparently so may bring about, is well illustrated by a concrete example *Strachey & Winterbottom's* No. 36 is represented in Calcutta Herbarium by two sheets, which are practically *fac-similes* of each other in every respect save one; this is that in one of the specimens the gland-heads are very apparent, in the other they have all fallen off. No. 36 is quoted by Meisner under his VAR. *Thunbergianum*, which he describes as eglandular hispidulous. He had seen a specimen on the peduncles of which only the gland-stalks had remained, and, misled by its hispidulous appearance, had placed it under *Thunbergianum*, whereas it is typical *ovalifolia*. The variety *scabra* includes both Meisner's *scabrum* and the variety *hispida* of the *Flora of British India*. Griffith's Khasia Hill specimen agrees precisely with Meisner's description of his variety *scabrum*, and between it and Gallatly's typically hispid specimens are all gradations.

56. *Polygonum Gilesii Hemsley. (Hook. *Icones Plant.*, vol. xviii, Pl. 1756).

Herb? everywhere glabrous; branches above filiform, at least three feet long. *Leaves* very few on the lower part of the stem, petioled, rather fleshy, cordate, about ·5 in. broad. *Stipules* small, sc le-like. *Flowers* small, apparently white, very shortly pedicelled. *Perianth*-segments oblong, obtuse. *Stamens* 8, included *Nut* smooth, exserted.

VI.—NORTH-WEST HIMALAYA: (1) Gilgit; *Giles*! (9) Chitral, 6,000 ft., *Harriss*, Duthie's No. 16577! Jambatai, 10,000 ft., *Duthie's*, No. 16576!

The description is taken from Hemsley in Hooker's *Icones Plantarum*, vol. xviii, Pl. 1756.

SECTION IX.—ECHINOCAULON Meisn.

57. Polygonum muricatum Meisn.

VII.—NEPAL: *Wallich*, No. 1724!

VIII.—EASTERN HIMALAYA: No specimen in the Calcutta Herbarium.

IX.—ASSAM: (4) Khasia Hills; Cherra, 4,000 ft., *C. B. Clarke*, No. 7267! Surareen, 5,000 ft., *C. B. Clarke*, No. 40419 A! Shillong, 5,000 ft., *C. B. Clarke*, No. 40523 A! Sadoo, 5,500 ft., *C. B. Clarke*, No. 44869!

58. Polygonum arifolium Linn.

VIII.—EASTERN HIMALAYA: (1) Sikkim; Dikeeling, 5-7,000 ft., *C. B. Clarke*, Nos. 9640 B and C, and 9728 C!

IX.—ASSAM: (4) Khasia Hills; *Hooker & Thomson*, No. 58! The writer can see no difference between this species, as exemplified by the above-quoted numbers, and Henry's Central China plant from Hupeh, No. 5080, *Polygonum senticosum* Meisn. of Forbes and Hemsley's enumeration.

59. Polygonum perfoliatum Linn.

V.—BENGAL: (6) Central Bengal; Munshiganj, *C. B. Clarke*, No 4727! Faridpur, *C. B. Clarke*, No. 7504!

VI.—NORTH-WEST HIMALAYA: (22) Kumaon: Ramgunga Valley, 3,000 ft., *Duthie*, No. 3785!

VII.—NEPAL: *Wallich*, No. 1696!

VIII.—EASTERN HIMALAYA: (1) Sikkim and Darjeeling District; *Watt*, No. 5574! Rungno Valley, 5,000 ft., *T. Anderson*, No. 237! *Kurz*! Ryang Valley, *King*, No. 579! Mamring, 4,000 ft, *Gammie*!

IX.—ASSAM: (4) Khasia Hills; *Hooker & Thomson*! *Mann*! (7) Manipur; *Watt*, No. 6828! (8) Brahmaputra Valley; *Masters*! (9) Sylhet; *Wallich*, No. 1696 B!

X.—BURMA: (6) Shan Hills; Fort Stedman and Keng Taung, *King's collector*!

60. Polygonum sagittatum Linn.

VI.—NORTH-WEST HIMALAYA: (22) Kumaon; Bhim Tal, 4-5,000 ft., *Duthie*, No. 4353!

IX.—ASSAM: (4) Khasia Hills; Shillong, 5,000 ft., *C. B. Clarke*, No. 5759! Mansmon, 4,000 ft., *C. B. Clarke*, No. 16001! Maolingkaden, 4,000 ft., *C. B. Clarke*, No. 44814 A! (7) Manipur; Myang Khong Valley, *Watt*, No. 7149!

61. Polygonum strigosum R. Br.

III.—PENINSULAR INDIA: (4) Nilgiris; *Schmidt*! *Gough*! Ootacamund, *King*! *Gamble*, No. 15377! Pykara, *Gamble*,

No. 12051! (9) Madura District; Kodaikanal Lake Pulney Hills, *Bourne*, No 696!

V.—BENGAL: (5) North Bengal; Siliguri, *Kurz*! Sukna, *Gamble*, 2964 B! Dalkajhar, 500 ft., *C. B. Clarke*, No. 36871 A! (6) Central Bengal; Faridpur, *C. B. Clarke*, No. 7488!

VI.—NORTH-WEST HIMALAYA: (22) Kumaon; Bhim Tal, 4,400 ft., *Strachey & Winterbottom*, No. 7!

VII.—NEPAL: *Wallich*, No. 1697 A!

VIII.—EASTERN HIMALAYA: no specimens in Calcutta Herbarium.

IX.—ASSAM: (4) Khasia Hills; *Mann*, No. 347! Kalapani, 5,000 ft., *C. B. Clarke*, No. 19031 B! (6) Naga Hills; Jolabusty, *Prain's collector*, No. 330! (9) Sylhet; *Wallich*, No. 1697 B! *C. B. Clarke*, 7133!

X.—BURMA: (1) Chittagong Hill Tracts; *King's collector*, Nos. 98 and 556! (3) Chin Hills; *Abdul Huk*! (6) Shan, Hills; Bhamo, *Abdul Huk*!

XI.—MALAY PENINSULA: Pulau Penang, *Wallich*, No. 1697 D!

62. Polygonum prætermissum Hook. f.

VIII.—*EASTERN HIMALAYA: *T. Thomson*! *Kurz*! *Gammie*!

IX.—ASSAM: (4) Khasia Hills; Maophlang, 5,500 ft., *C. B. Clarke*, No. 18584 A!

All the specimens in the Calcutta Herbarium show glandular peduncles, although in some the glands have been almost entirely rubbed off, so that the peduncles appear on casual inspection as if glabrous.

63. *Polygonum birmanicum sp. nov.

An annual herb with slender procumbent stem, faintly grooved and with angles slightly puberulous or glabrous; internodes about 3·5—6·5 cm. long. Lower *leaves* petioled, hastate, acute, upper *leaves* sessile amplexicaule, glabrous on both surfaces or faintly scabrid on the veins above and below; petiole 2—3·5 cm. long; lamina 2·5—6·5 cm. long, ·8—2 cm. broad. *Stipules* small spathelike, glabrous, eciliate, 4—8 mm. long. *Inflorescence* of about 3—6 slender simple axillary and branched terminal flaccid racemes, about 8·5—17 cm. long, each bearing about 6—·2 distant bracts. *Bracts* tubular, glabrous, eciliate, unilaterally acuminate, ·7 cm. long, with 2-4 flowers in the axil of each, exserted on pedicels 8 mm. long. *Flowers* small, about 4 mm. across or less. *Perianth*-segments 5, eglandular. *Stamens* 8, unequal. *Ovary* triquetrous, smooth; stigma trifid.

X.—BURMA: (6) Shan Hills; *King's collector*, No. 640! Fort Stedman, *King's collector*, No. 469! Indi, Keng Taung, Taungyi, Thamakhan in Southern Shan States, *King's collector*!

This is a quite distinct species near to *Polygonum prætermissum*, but distinguished therefrom by its much longer, quite glabrous and eglandular racemes.

64. Polygonum pedunculare Wall.

III.—PENINSULAR INDIA: (4) Nilgiris; Waterfield, *King*!

V.—BENGAL: (5) North Bengal; Dalkajhar, 500 ft., *C. B. Clarke*, No. 36798 C!

IX.—ASSAM: (6) Naga Hills; Jaboca; *Prain's collector*, No. 54! (8) Brahmaputra Valley; Orang, *Shaik Mokim*, No. 22! Dalgaon, *Shaik Mokim*, No. 336! Udulguri, Darrang District, *Chatterjee*!

XI.—MALAY PENINSULA: *Kunstler*, No. 2498! Singapore, *Wallich*, No. 1718! Malacca, *Griffith*! Johore, *Ridley*, No. 4220! Perak, *Ridley*, No. 2965! *Wray*, No. 1888! Pahang, *Ridley*, No. 1616! Selangor, *Ridley*, No. 8175!

VAR. **angustissima.**

III.—PENINSULAR INDIA; *Wight*, K. D, No. 2460!

V.—*BENGAL: (2) Chutia Nagpur; Bokaro River, *Prain*!

VAR. **nilagirica.**

III.—PENINSULAR INDIA: (2) North Canara; Supa, *Talbot*, No 1383! (4) Nilgiris; Coonoor, 6,000 ft., *C. B. Clarke*, No. 10810 C and D! (9) Madura; Poombai, Pulney Hills, *Bourne*, No. 1151 in part!

VAR. **assamica.**

IX.—ASSAM: (4) Khasia Hills; *Mann*, No. 421! (8) Bramahputra Valley; Lakhimpur, *Masters*!

VAR. **glabrata.**

IX.—ASSAM: (9) Sylhet; *Wallich*, No. 6285!

SECTION X.—ACONOGON Meisn.

65. Polygonum alpinum All.

VI.—NORTH-WEST HIMALAYA: (1) Gilgit; *Giles*, No. 117! (2) Baltistan; Teing, Astor, and Goodeh, *Strachey & Winterbottom*, No. 698! (9) Chitral; *Younghusband*! (11) Hazara; Kagan Valley, *Inayat*, Duthie's No. 20123!

(12) Kashmir; Kajnag Range, 9-10,000 ft., *Duthie*, Nos. 10941 and 11086! Kanni Valley, 9-11,000 ft., *Duthie*, Nos. 12514 and 12521! Tragbol, 8,500 ft., *C. B. Clarke*, No. 29210 C! Drawa Pass, *Strachey & Winterbottom*, No. 434! Gulmarg, *Duthie*! (14) Lahul; Below Kolang, Bhaga Valley, 11,000 ft., *Holland*! (15) Kunawar; Pangi, *Herb. Kurz.*, No. 3978!

66. Polygonum paniculatum Blume.

VI.—North-West Himalaya, *Wallich*, No. 1686!

VII.—Nepal: No specimens in the Calcutta Herbarium.

VIII.—Eastern Himalaya: (1) Sikkim, *Hooker*! *Kurz*! *King*! Tonglo, 8-10,000 ft., *Thomson*! *Gamble*, No. 8418!

IX.—*Assam: (6) Naga Hills; Konoma, *Prain*!

The Wallichian sheet in the Calcutta Herbarium is misnamed *Polygonum polystachyum*.

67. Polygonum rude Meisn.

IX.—Assam: (4) Khasia Hills; *Griffith*, No. 418! Mairung, 5,500 ft., *C. B. Clarke*, No. 40259 A! Maolingkaden, 4,000 ft, *C. B. Clarke*, No. 44817 A! *Mann*, No. 375! Nunklow, *Simons*, No. 449!

X.—*Burma: (3) Chin Hills; *King's collector*! (5) Kachin Hills; *Prain's collector*! (6) Shan and Karen Hills; Natoung Hills, 7,000 ft., *Kurz*, No. 518!

68. Polygonum molle Don.

VI.—North-West Himalaya: (5) Kunawar and Bashahr; Chini, *Stewart*, Brandis, No. 2883!

VII.—Nepal: *Wallich*, No. 1685 in part! *Hamilton*! *Scully*, No. 268!

VIII.—Eastern Himalaya: (1) Sikkim and Darjeeling District. Mons Lepcha, old Lebong Road, *T. Thomson*! Rungno Valley, 4,000 ft., *Kurz*! *T. Anderson*, No. 238! Senchal, 8,000 ft., *T. Anderson*, Nos. 1137 and 1149! Darjeeling, *T. Anderson*, No. 1136! Rungbee, 6,000 ft., *C. B. Clarke*, Nos. 8549 and 12449! Lachung Valley, 9,000 ft., *Gammie*! (2) Bhutan; *Parkes*!

69. Polygonum frondosum Meisn.

VI.—North-West Himalaya: (19) Kangra; Dharmsala, *Edgeworth*! (22) Kumaon; below Paton, 5,600 ft., and Hurdole Pass, *Strachey & Winterbottom*, No. 34!

This species is exceedingly like *Polygonum paniculatum* Bl., from which in the dry state it can only be distinguished by the glabrous margins of its leaves.

70. Polygonum polystachyum Wall.

VI.—NORTH-WEST HIMALAYA: (11) Hazara; Kagan Valley, 14,400 ft., *Inayat*, Duthie's No. 20124! (12) Kashmir; Marbal Pass, *Stoliczka*! (13) Kistawar; 5-8,000 ft., *Stoliczka*! (14) Lahul; *Jaeschke*! (15) Kunawar and Bashahr; Asrang, 11,000 ft., *Lace*, No. 395! Pangi, *Stoliczka*! (18) Chamba; Dalhousie, *Clark*, No. 144! *Grant*! (19) Kangra; Laka, 11,000 ft., *C. B. Clarke*, No. 24541 A and B! (20) Simla; Nagkanda, 9,000 ft., *Gamble*, No. 6567 B! Sirmoor, *Vicary*! (21) Garhwal; *Strachey & Winterbottom*, No. 32! Below Kidarkanta, near Oura, 6-7,000 ft., *Duthie*, No. 1424! (22) Kumaon; *Wallich*, No. 1686-1! Saba to Ralum, 9-12,000 ft., *Strachey & Winterbottom*, No. 33!

VIII.—EASTERN HIMALAYA: (1) Sikkim; Darjeeling, *Gamble*, No. 2718 C! Phalut, 11,000 ft., *T. Thomson*! Phullalong, 10,000 ft., *C. B. Clarke*, No. 13399 C and E! Jongri, 13-15,000 ft., *T. Anderson*, No. 1120! *C. B. Clarke*, No. 25814 J! *King's collector*! Nathu-la, Chola range, 14,000 ft., Tankra, 13,000 ft., *Gammie*, No. 382!

All the above-quoted specimens are more or less pubescent, but are unworthy of varietal separation on that account.

VAR. **crispata.**

VI.—NORTH-WEST HIMALAYA: Upper Chenab; *Ellis*, No. 646!

71. Polygonum rumicifolium Royle.

I.—NORTH-WEST FRONTIER: (1) Afghan border; *Griffith*, 1,040 and K. D. No. 4127! Kurram Valley, *Aitchison*, No. 794!

VI.—NORTH-WEST HIMALAYA: (1) Gilgit; Kala-pani, 10,500 ft., *Giles*, No. 153! (9) Chitral; Ziarat, 7,200 ft., *Harriss*, Duthie's No. 16579! Mirga, 9,200 ft., *Gatacre*, Duthie's No. 17508! (11) Hazara; Siran Valley, *Inayat*, Duthie's No. 20112! (12) Kashmir; Burzil Valley, *Strachey & Winterbottom*, No. 604! Near Das Kurrim, *Strachey & Winterbottom*, No. 896! Above Kainmul, Liddar Valley, 11-12,000 ft., *Duthie*, No. 13135! (14) Lahul; *Hay*! *Jaeschke*! (15) Kunawar; *Vicary*! (21) Garhwal;

above Jhala, in the Ganges Valley, 12-13,000 ft., *Duthie*, No. 200 (*a*)! Taulea under Srikanta, 12,000 ft., *Duthie* No. 5481 (22) Kumaon; near Ralum, 11,500 ft., *Strachey & Winterbottom*, No. 42!

VII.—NEPAL: opposite Budhi village, Western Nepal, 10-11,000 ft., Duthie No. 5930!

Amongst the above sheets, specimens with retrorsely hairy stems and somewhat smaller leaves are fairly frequent.

72. Polygonum campanulatum Hook. f.

VI.—NORTH-WEST HIMALAYA: (22) Kumaon; Jhuni, 7,500 ft., *Strachey & Winterbottom*, No. 35!

VIII.—EASTERN HIMALAYA: (1) Sikkim; Tongloo, 10,000 ft., *King*! *Gamble*, No. 2701 B and C! Singalelah, 11,000 ft., *Gammie*, No. 82! Phullalong, 9-10,000 ft., *C. B. Clarke*, Nos. 12587 B and 13482 B, C, F! Jongri, 13-15,000 ft., *T. Anderson*, No. 1154! Gyree Basha, 12,000 ft., *King's collector*! Lachung Valley, 9,000 ft., *Gammie*, Nos. 657 and 1106! Tankra, *Gammie*, No. 489!

VAR. **fulvida.**

VII.—NEPAL: Thari, 12,000 ft., *King's collector*!

VIII.—EASTERN HIMALAYA: (1) Sikkim; Phalut, 10,000 ft., *T. Thomson*! Tongloo, 8-11,000 ft., *T. Thomson*! *T. Anderson*, Nos. 1122 and 1124! *King*! *C. B. Clarke*, No. 27506 E and G! *Gamble*, Nos. 757 and 1602 C! Jongri, *King's collector*! Thangme, 14,000 ft., *King's collector*! Lachung Valley, 11,000 ft., *Gammie*, No. 752! (2) Tibet and Bhutan; *King's collector*, No. 445! Pheemong, near Chumbi, *King's collector*! Kunboo, Chumbi, *King's collector*, No. 135!

The varieties *membranifolia* and *longipes* have not been separated out by the writer.

73. Polygonum tortuosum Don.

VI.—NORTH-WEST HIMALAYA: (2) Baltistan; *Strachey & Winterbottom*, No. 649! (4) Dras; Marpu Nullah, above Dras, 11-12,000 ft., *Duthie*, No. 11774! Kargil, *Stoliczka*! (7) Rupchu; 15-18,000 ft., *Stoliczka*! (12) Kashmir; Suru, *Stoliczka*! Gudhai Valley, 11-12,000 ft., *Duthie*, No. 12195! Kashmir Valley, *Hunter-Weston*, Duthie's No. 10274! (15) Kunawar and Bashahr, *Vicary*! Harang, 11,500 ft., *Brandis*, No. 3557!

13,000 ft., *Lace*, No. 542! (21) Garhwal; Rhudughera-ka Godh, 11-14,000 ft., *Duthie*, No. 199! Gangotri, 12-13,000 ft., *Duthie*, No. 1980! (22) Kumaon; Kulti Valley, 14-15,000 ft., *Duthie*, No. 592!

This species has also been found by Lama Ujyen Gyatsko, Nos. 77 and 271, the precise locality unknown, but probably within Tibetan territory to the north of Sikkim.

VAR. **spicata.**

VI.—NORTH-WEST HIMALAYA: *T. Thomson*! *Stoliczka*! (2) Baltistan; Chatpani Nullah, 10-11,000 ft., *Duthie*, No. 13808!

74. Polygonum sibiricum Laxm.

VI.—NORTH-WEST HIMALAYA: *T. Thomson*, Nos. 36 and 37! *Hay*! *Stewart*! (1) Gilgit; *Giles*! (7) Rupchu; 15-18,000 ft., *Stoliczka*!

VIII.—EASTERN HIMALAYA: (2) Tibet; *Lama Ujyen Gyatsko*, No. 124! Phari, *King's collector*!

75. Polygonum Hookeri Meisn. (*Ann. Sci. Nat.*, ser. 5, vol. vi, p. 352). Polygonum acaule *Hook f., not of Boissier.*

VIII.—EASTERN HIMALAYA: (1) Sikkim; *Hooker*, No. 70! Ghora-la, 16,500 ft., *Gammie*, No. 823!

76. Polygonum nummularifolium Meisn.

VI.—NORTH-WEST HIMALAYA: (12) Kashmir; Sangam Valley, *Duthie*, No. 13553! (21) Garhwal; Pilkanta, 13-14,000 ft., *Duthie*, No. 4362! (22) Kumaon; Barji Kang Pass, 14,500 ft., *Strachey & Winterbottom*, No. 43!

VIII.—EASTERN HIMALAYA: (1) Sikkim; *Hooker*! Tankra-la, 16,000 ft., and Kang-la, 15,000 ft., *Gammie*, No. 505! Momay Samdong, Lachung Valley, 17,000 ft., *Gammie*, No. 861!

SECTION XI.—TINIARIA Meisn.

77. Polygonum Convolvulus Linn.

I.—NORTH-WEST FRONTIER: (1) Afghan border; Kurram Valley, *Aitchison*, No. 657!

VI.—NORTH-WEST HIMALAYA: (6) Zanskar; east of the Pensi-la *Stoliczka*! (15) Kunawar; Pangi (?) *Stoliczka*!

VIII.—*Eastern Himalaya: (1) Sikkim; King, No. 4004! (2) Tibet; Chumbi, *King's collector*! Le-ra-ong, *King's collector*!

78. Polygonum dumetorum Linn.

I.—North-West Frontier: (1) Afghan border; Kurram Valley, *Aitchison*!

VI.—North-West Himalaya: (9) Chitral and Dir; Dir, 6,500 ft., *Harriss*, Duthie's No. 16583! Dir Valley, 4,200 ft., *Gatacre*, Duthie's No. 17513! Near Drosh, *Hamilton*, Duthie's No. 17916! (11) Hazara; Kagan Valley, *Inayat*, Duthie's No. 20127! (12) Kashmir; Sonamurg, 10,000 ft., *C. B. Clarke*, No. 30834 A! Near Gurais, 8,000 ft., *Duthie*, No. 14,000! Gandesbal, 5,500 ft., *Gammie*! (13) Kistawar; 5-8,000 ft., *Stoliczka*! (15) Kunawar and Bashhar; Pangi, *Stoliczka*! Chini, *Munro*! *Brandis*; No. 2739! (18) Chamba; Chamba, 3,000 ft. *C. B. Clarke*, No. 23772 B! *Herb. Kurz*, No. 4273! Dalhousie, 4,500 to 7,000 ft., *Grant*! *C. B. Clarke*, No. 23145 D and E! Alwas to Baira, 6-8,000 ft., *Lace*, No. 1866! (20) Simla; *Gamble*, No. 4832 D!

79. Polygonum pterocarpum Wall.

VI.—North-West Himalaya: *Royle*! (22) Kumaon; *Wallich*, No. 1690!

VIII.—Eastern Himalaya: (1) Sikkim; Darjeeling; 6,000 ft., *King*! *Gamble*, Nos. 130 B, 2682 A, 8521! Hee, 4,000 ft., *C. B. Clarke*, No. 13427 A and E! Lingdam, 4,000 ft., *C. B. Clarke*, No. 13051 C! Yaksum, 4,500 ft., *T. Anderson*, No. 1156! Lachung Valley, 7,000 ft., *Gammie*, No. 1192!

PART II.—ARTIFICIAL KEY.

The key for the most part explains itself, but it may be as well to state explicitly what the writer means by certain terms. Under the term 'axillary' the writer includes even capitula-like clusters, so long as they are in the axils of *unmodified* leaves, whether confined to the apical portion of the stem and branches or not Thus *Polygonum delicatulum* has capitula-like clusters, but they are distinctly in the axils of unmodified leaves, and consequently are classed as axillary. Under the term 'head' the writer includes all more or less globose clusters—whether they are 'capitula' in the rigid botanical sense or not—which are not in the axils of unmodified leaves, but which may be in the axils of

bracts, as is seen in *Polygonum alatum*. Two plants at least, *Polygonum Hookeri* and *Polygonum plebejum* var. *effusa*, have had to be entered twice, as the former may be picked up with a spicate or with a paniculate inflorescence, and the latter with short leaves or long and slender leaves.

I.—Twining Plants.

* Fruit not winged . . . . . P. Convolvulus.
** Fruit winged
Wings very little if at all prolonged down the pedicel . . . . . P. dumetorum.
Wings prolonged down to the base of the pedicel . . . . . P. pterocarpum.

II.—Non-twining Plants.

A. *Inflorescence axillary.*

* Leaf lamina, elliptic, ovate or orbicular, length not more than four times the breadth, usually much less
† Stipules with two distinct excurrent nerves
The excurrent nerves spinescent and leaves mucronulate . . . P. biaristatum.
The excurrent nerves not spinescent and leaves not mucronulate . P. recumbens.
†† Stipules without excurrent nerves
§ Leaves hirsute . . . . P. filicaule.
§§ Leaves glabrous
× Plants tufted delicate annuals with very minute flowers, bipartite stipules and non-tubular bracts
Leaves opposite . . P. islandicum.
Leaves alternate . . P. delicatulum.
× × Plants not tufted but prostrate or ascending with fair-sized flowers, with tubular bracts and tubular stipules, which latter may be slightly or much lacerate

○ Flowers pedicels long, exserted well beyond the stipules . P. plebejum VAR. effusa.

○○ Flowers sessile or pedicels quite short and very little if at all exserted beyond the stipules

▲ Stipules many-nerved

Nut polished, smooth P. plebejum VAR. polyneura.

Nut dull, striolate . P. aviculare.

▲▲ Stipules nerveless or showing only one or two nerves

‖ Leaf lamina broadly elliptic, rather large, 1-1·5 cm. long by ·5-1 cm. broad, shortly petioled . P. cognatum.

‖‖ Lamina orbicular or oblong, very small, usually not more than 4 mm. in diameter, sessile

Branches very numerous; leaves orbicular, apiculate with a distinct median ridge; stipules very crinite and woolly looking . P. plebejum VAR. Griffithii.

Branches not very numerous; leaves oblong; sti-

pules fimbriate not woolly
Flowers and nutlets of average size — P. plebejum VARS. indica and brevifolia.
Flowers and nutlets very minute — P. plebejum VAR. micranthema.

** Leaf lamina linear or subulate, length more than four times the breadth, usually a good deal more

† Internodes, especially upper ones, almost or quite hidden by the very prominent white hyaline stipules which also considerably overlap the leaves

§ Plant very dwarf, 2·5-5 cm., and of thread-like slenderness — P. molliæforme.

§§ Plant always at least over 10 cm., with stoutish branches, as thick as the lead of a pencil or thicker

Root slender, annual — P. tubulosum.
Root-stock very stout and woody — P. paronychioides.

†† Stipules confined to the base of the internodes, leaving the greater part ($\frac{3}{4}$—$\frac{7}{8}$) of each internode uncovered

§ Branches erect and rigid or erect and flexuous or erect and geniculate

× Leaves comparatively large, 2-4·5 cm. long and ·4-·6 cm. broad, narrowly lanceolate with lateral nerves coming off at an acute angle from the midrib — P. setosum.

× × Leaves minute, never more than 1 cm. long, linear, subulate; no lateral nerves

Leaf-apex with a distinct hyaline mucro. . . P. afghanicum.
Leaf-apex without a mucro. . . . P. salicornioides.

§§ Branches prostrate
Stipules very white, almost entire. Internodes very smooth, angled but not grooved. Leaves very small subulate, fleshy, mucronulate . . P. polycnemoides.
Stipules brownish, fimbriate. Internodes grooved. Leaves up to 2 cm. long, linear or narrowly lanceolate, flat, not mucronulate . . . P. plebejum and its variety elegans.

Flowers exserted on long pedicels . . . . . P. plebejum VAR. effusa.

B. *Inflorescence of sessile or pedicelled flowers closely set on unbranched spikes or spiciform racemes.*

* Leaves all sessile or only very shortly petioled

† Laminæ orbicular, broadly elliptic or oblong
Plant dwarf, not creeping, leaves all radical and very hairy . . . P. Hookeri.
Plant not dwarf, creeping, leaves cauline and glabrous . . . . P. vaccinifolium.

†† Laminæ linear or linear-lanceolate
Racemes many-flowered, from 60 upwards . . . . . P. affine.
Racemes few-flowered, rarely as many as 20 . . . . . P. Emodi.

** All or at least the lower leaves long-petioled

† Leaves ovate-cordate, upper ones amplexicaul
Petiole winged above . . . P. Bistorta.
Petiole not winged . . . . P. amplexicaule.

†† Leaves lanceolate or linear lanceolate not amplexicaul

§ Lower part of inflorescence bulbiliferous . . . . . P. viviparum.

§§ Inflorescence not bulbiliferous

× Leaf-margins smooth. Leaves usually floating . . P. amphibium.

× × Leaf margin crenulated with marginal veinlets. Leaves not floating

Lamina abruptly or acutely continuous with petiole P. sphærostachyum.

Lamina very gradually continuous with petiole . P. paleaceum.

C. *Inflorescence of sessile or pedicelled flowers, closely set or distant on branched short stout, or long slender spikes or spiciform racemes.*

* Plants more or less beset with recurved prickles which are often restricted to the base of stipules

† Stipules orbicular foliaceous. Leaves peltate-deltoid ; very long-petioled . P. perfoliatum.

†† Stipules tubular membranous. Leaves linear or linear-oblong, ovate or oblong-ovate, or linear-sagittate, or hastate; shortly petioled

§ Racemes slender, 2·5 cm. or more in length. Bracts distant. Leaves linear-sagittate or hastate . . . . . P. prætermissum.

§§ Racemes very short, ·5-1 cm long. Bracts crowded. Leaves ovate or oblong-ovate or linear-oblong

× Leaves linear or linear-oblong, margin and midrib closely beset with strong recurved prickles . P. strigosum.

× × Leaves ovate or oblong-ovate. Prickles absent from margin, and midrib, or only very feebly developed . P. muricatum.

** Plants unarmed

† Racemes stout, compact. Bracts closely imbricating

§ Nut orbicular or bi-convex

× Peduncles scurfily glandular
Leaves without canescence beneath . . . P. lapathifolium.
Leaves canescent beneath . P. lapathifolium SUB-SP. maculatum.

×× Peduncles eglandular and either glabrous or hairy
○ Stipules and bracts eciliate
Plant glabrous . . P. glabrum.
Plant covered with a cottony tomentum . P. lanigerum.
○○ Stipules and bracts ciliate
△ Leaves long-petioled . P. orientale.
△△ Leaves short petioled or sessile.
‖ Peduncles strigosely hairy
Stipules with a spreading or recurved scabrid limb P. limbatum.
Stipules without a limb . P. tomentosum.
‖‖ Peduncles glabrous
Spikes oblong-cylindrical. Nut not less than 3 mm. long . . P. Persicaria.
Spikes narrowly cylindrical. Nut not more than 1·5 mm. long . . P. minus.

§§ Nut trigonous
× Branches and peduncles glandular and hairy . . P. viscosum.
×× Branches and peduncles hairy or glabrous but never glandular
○ Bracts and perianth finely glandular . . . P. macranthum.

○○ Bracts and perianth eglandular

△ Bracts more or less hairy . . . P. stagninum.

△△ Bracts quite glabrous

Leaf-bases acute or acuminate . P. barbatum.

Leaf-bases obtuse or slightly cordate . P. serrulatum.

†† Racemes slender, loose. Bracts more or less interrupted

§ Perianth glandular

Raceme long-interrupted. Stipular cilia at least half as long as the tube or longer. Leaves glabrous or very sparingly hairy P. flaccidum.

Leaves hispidly hairy at least beneath . . . . . P. flaccidum VAR. hispida.

Raceme short-interrupted. Stipular cilia quite short or absent . . . . P. Hydropiper.

Whole plant minutely glandular P. Hydropiper VAR. glandulosissima.

§§ Perianth eglandular

× Stipules and bracts entire or only slightly fimbriate; never ciliate

Leaves sagittate or hastate.

Racemes flaccid . . P. birmanicum.

Leaves elliptic-lanceolate.

Racemes rather strict . P. Bellardi.

×× Stipules and bracts ciliate.

○ Nut bi-convex.

Styles hooked . . P. virginianum.

Styles not hooked . P. assamicum.

○○ Nut trigonous.

Nut sharply trigonous, perfectly smooth and polished . . P. Posumbu.

Nut obtusely trigonous, finely puncticulate . P. mite.

D. *Inflorescence of small more or less globose or obpyramidal heads.*

* Plants dwarf, not exceeding 15 cm. in height, often tufted

† Leaves orbicular . . . . P. nummulari-folium.

†† Leaves linear.

Leaves flat with two basal auricles . P. sibiricum.

Leaf margins recurved, and wanting basal auricles . . . . P. perpusillum.

††† Leaves neither orbicular, nor linear

§ Heads in the axil of an involucral leaf . . . . . P. alatum VAR. rigidula.

§§ Heads without an involucral leaf

Leaves subsessile. Nut bi-convex . . . . . P. humile.

Leaves long-petioled. Nut trigonous . . . . . P glaciale.

** Plants not dwarf and never tufted.

† Plants armed more or less with recurved prickles, which may be reduced to a few at the base of the stipules

§ Peduncles glabrous . . . P. sagittatum.

§§ Peduncles glandular

× Leaves broadly hastate-acuminate, long-petioled. Nut trigonous . . . P. arifolium.

× × Leaves elliptic-oblong or linear-oblong, short-petioled. Nut orbicular bi-convex

○ Peduncles sparingly branched, with medium-sized heads

Leaves elliptic-lanceolate or ovate, acuminate at both ends . . P. pedunculare.

Leaves oblong or oblong-lanceolate, 1·9-2·5 cm. broad . . . P. pedunculare VAR. nilagirica.

Leaves linear-lanceolate, very narrow, ·6-·8 cm. broad . . . P. pedunculare VAR. angustissima.

○○ Peduncles exceedingly slender branching freely and dichotomously and ending in very small heads . . P. pedunculare VAR. assamica.

†† Plants unarmed

§ Capitula at the apex of exceedingly long, slender, erect, and rodlike stems, with very distant nodes, entirely naked or showing only one or two small feebly developed leaves on the lowest nodes. Stipules scale-like . P. Gilesii.

§§ Capitula on distinct solitary or branched peduncles arising from ordinary leafy branches. Stipules tubular

× Leaves pinnatifidily lobed

Leaves coarsely lobed. Peduncles glandular-hairy . P. runcinatum.

Leaves finely cut. Peduncles glabrous . . P. sinuatum.

× × Leaves entire

○ Peduncles quite glabrous

Petiole winged; non-auriculate . . P. microcephalum.

Petiole auriculate, not winged . . P. Wallichii.

○○ Peduncles glandular-hairy or hispidulous, at least near the heads

△ Every or almost every head in the axil of an involucral leaf . P. alatum.

△ △ Heads not in the axils of involucral leaves

‖ Main peduncles ending in a single capitulum or dividing into only 2-4 unicapitate branches

◇ Plant a tall erect shrub . . P. chinense VAR. corymbosa.

◇◇ Plant creeping or, if erect, small and herbaceous

▽ Petiole broadly winged to the base

Leaves large, 10-12 cm. long from base of petiole to apex of lamina. Bracts not showing dots P. sphærocephalum VAR. Wightiana.

Leaves small, not more than 4 cm. long including petiole. Bracts showing one or more white dots . . P. alatum VAR. parviflora.

▽▽ Petiole, if present, not winged or only very slightly at the top.

Leaves subsessile, auriculate . P. capitatum.

Leaves long-petioled, non-auriculate . . P. sphærocephalum.

‖‖ Main-peduncles paniculately branched with numerous heads

◇ Plant a small diffusely branched herb, very slender and small leaved . P. alatum VAR. tenuicaulis.

◇◇ Plant a shrub, with large leaves

▽ Leaves scabridly hairy on both surfaces . P. chinense VAR. scabra.

▽▽ Leaves glabrous or almost so

Leaves very broadly oval P. chinense VAR. ovalifolia.

Leaves broadly lanceolate . P. chinense.

E. *Inflorescence paniculate.*

* Plant dwarf, unbranched, with only radical leaves . . . . . P. Hookeri.

** Plants shrubby and much branched, with cauline leaves

† Flowers very small not more than 4 mm. in diameter

§ Plants glabrous

Leaf-margins ciliolate . . P. paniculatum.

Leaf-margins smooth . . P. frondosum.

§§ Plants strigosely hairy, often with the hairs on the branches retrorse . . . . . P. rude.

§§§ Plants more or less pubescent

Perianth baccate in fruit . . P. molle.

Perianth not baccate . . P. alpinum.

†† Flowers large, not less than 6 mm. in diameter

§ Perianth campanulate

Plant a low shrub with sessile leaves and dense-flowered panicle . . . . P. tortuosum.

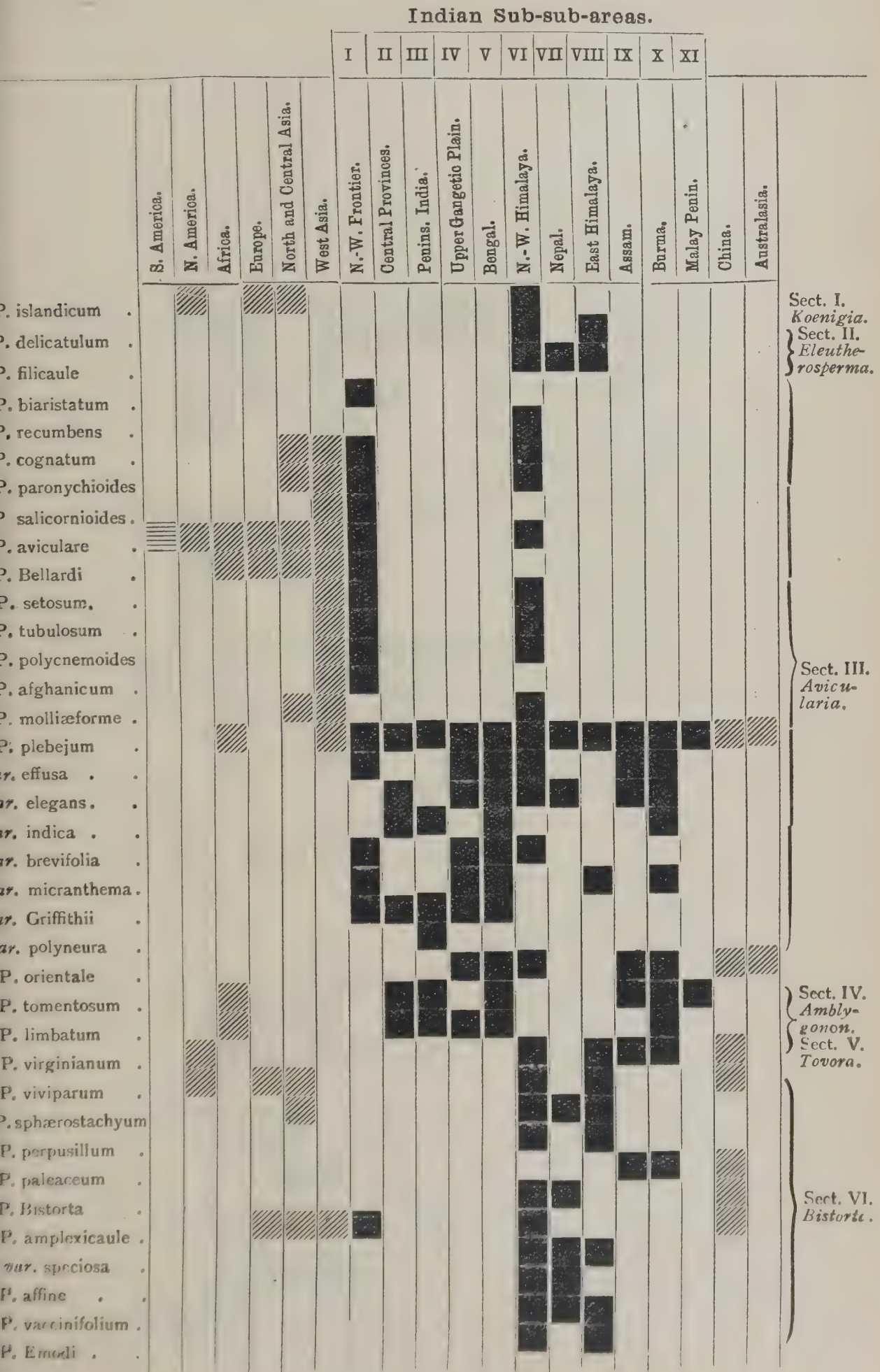
Plant a shrub of 2-4 ft. high with petioled leaves and lax divaricate cymes	P. campanulatum.
Leaves with a dense fulvous tomentum on the lower surface	P. campanulatum VAR. fulvida.
§§ Perianth widely spreading	
Tall shrub 3-6 feet high, with large spreading terminal panicles	P. polystachyum.
Herbaceous plant not more than 1½ feet high, with small dense panicles axillary as well as terminal	P. rumicifolium.

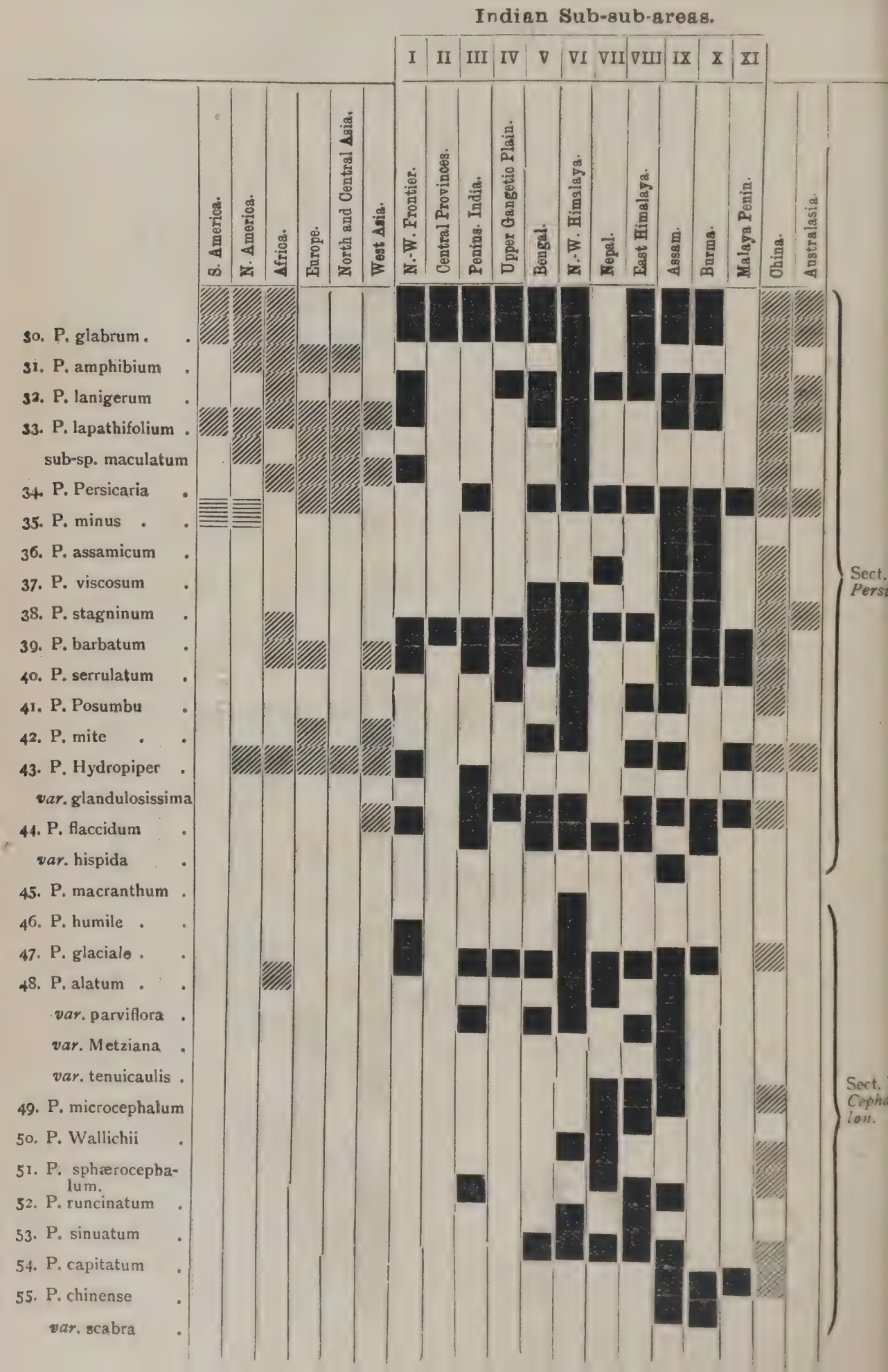
PART III.—DISTRIBUTION.

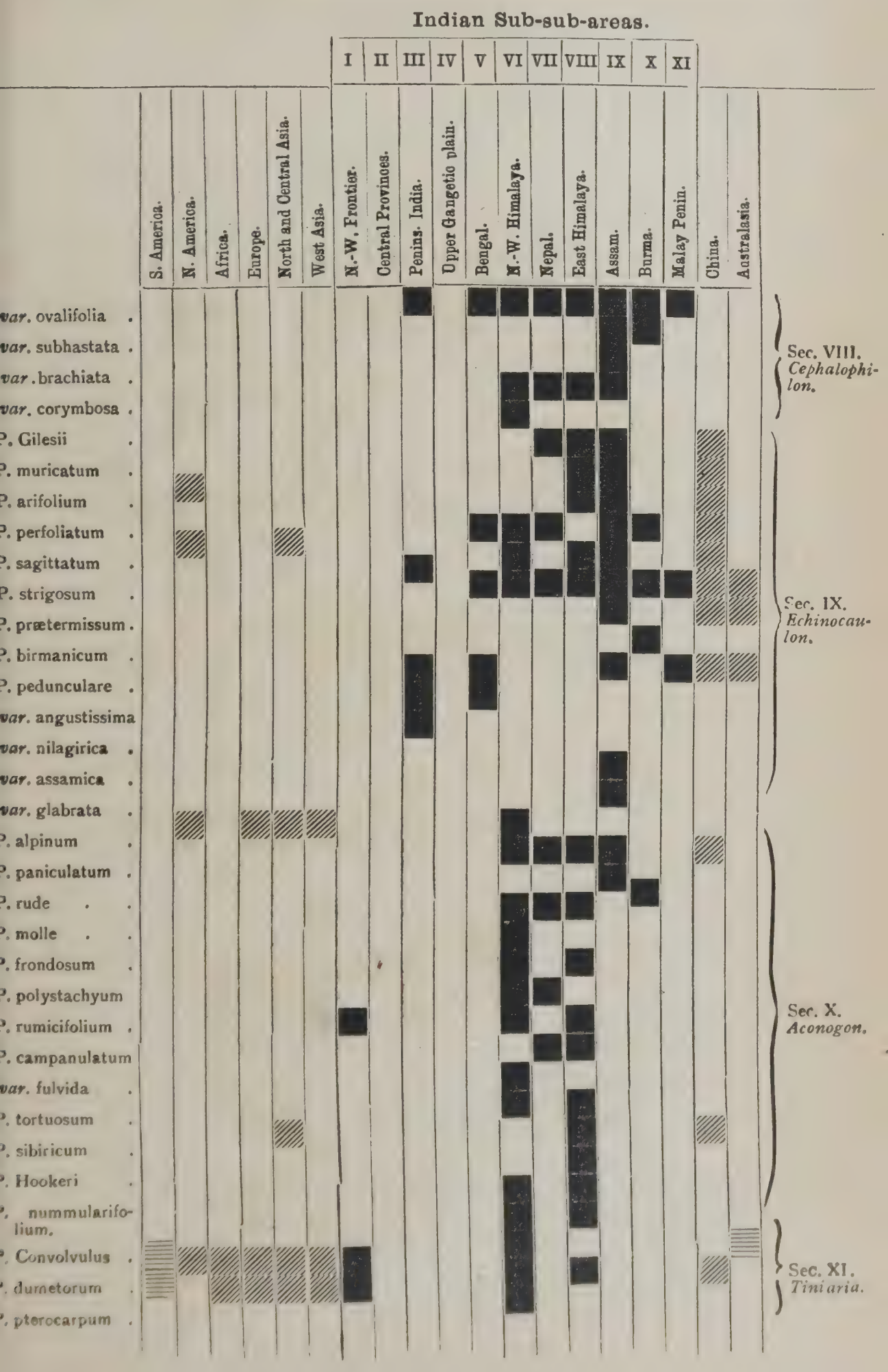
General latitudinal distribution of the Indian species.

In the following diagram the intra-Indian distribution to the various sub-sub-areas is given in black, the extra-Indian distribution in squares which are shaded diagonally when the species is indigenous, horizontally when the species is known to be introduced.

The diagram is followed by an analytical table of the extra-Indian distribution of the non-endemic species, after which is given a table of the intra-Indian distribution of the endemic species.


Indian Sub-sub-areas.
I
II
III
IV
V
VI
VII
VIII
IX
X
XI
S. America.
N. America.
Africa.
Europe.
North and Central Asia.
West Asia.
N.-W. Frontier.
Central Provinces.
Penins. India.
Upper Gangetic Plain.
Bengal.
N.-W. Himalaya.
Nepal.
East Himalaya.
Assam.
Burma.
Malay Penin.
China.
Australasia.
P. islandicum
P. delicatulum
P. filicaule
P. biaristatum
P. recumbens
P. cognatum
P. paronychioides
P. salicornioides
P. aviculare
P. Bellardi
P. setosum.
P. tubulosum
P. polycnemoides
P. afghanicum
P. molliæforme
P. plebejum
var. effusa
var. elegans.
var. indica
var. brevifolia
var. micranthema.
var. Griffithii
var. polyneura
P. orientale
P. tomentosum
P. limbatum
P. virginianum
P. viviparum
P. sphærostachyum
P. perpusillum
P. paleaceum
P. Bistorta
P. amplexicaule
var. speciosa
P. affine
P. vaccinifolium
P. Emodi
Sect. I. Koenigia.
Sect. II. Eleutherosperma.
Sect. III. Aviculatia.
Sect. IV. Amblygonon.
Sect. V. Tovora.
Sect. VI. Bistorta.


Indian Sub-sub-areas.
I
II
III
IV
V
VI
VII
VIII
IX
X
XI
S. America.
N. America.
Africa.
Europe.
North and Central Asia.
West Asia.
N.-W. Frontier.
Central Provinces.
Penins. India.
Upper Gangetic Plain.
Bengal.
N.-W. Himalaya.
Nepal.
East Himalaya.
Assam.
Burma.
Malaya Penin.
China.
Australasia.
30. P. glabrum .
31. P. amphibium .
32. P. lanigerum .
33. P. lapathifolium .
sub-sp. maculatum
34. P. Persicaria .
35. P. minus .
36. P. assamicum .
37. P. viscosum .
38. P. stagninum .
39. P. barbatum .
40. P. serrulatum .
41. P. Posumbu .
42. P. mite .
43. P. Hydropiper .
var. glandulosissima
44. P. flaccidum .
var. hispida .
45. P. macranthum .
46. P. humile .
47. P. glaciale .
48. P. alatum .
var. parviflora .
var. Metziana .
var. tenuicaulis .
49. P. microcephalum
50. P. Wallichii .
51. P. sphærocephalum.
52. P. runcinatum .
53. P. sinuatum .
54. P. capitatum .
55. P. chinense .
var. scabra .
Sect. Persi
Sect. Cepha lon.


Indian Sub-sub-areas.
I
II
III
IV
V
VI
VII
VIII
IX
X
XI
S. America.
N. America.
Africa.
Europe.
North and Central Asia.
West Asia.
N.-W. Frontier.
Central Provinces.
Penins. India.
Upper Gangetic plain.
Bengal.
N.-W. Himalaya.
Nepal.
East Himalaya.
Assam.
Burma.
Malay Penin.
China.
Australasia.
var. ovalifolia
var. subhastata
var. brachiata
var. corymbosa
P. Gilesii
P. muricatum
P. arifolium
P. perfoliatum
P. sagittatum
P. strigosum
P. prætermissum
P. birmanicum
P. pedunculare
var. angustissima
var. nilagirica
var. assamica
var. glabrata
P. alpinum
P. paniculatum
P. rude
P. molle
P. frondosum
P. polystachyum
P. rumicifolium
P. campanulatum
var. fulvida
P. tortuosum
P. sibiricum
P. Hookeri
P. nummularifolium.
P. Convolvulus
P. dumetorum
P. pterocarpum
Sec. VIII. Cephalophilon.
Sec. IX. Echinocaulon.
Sec. X. Aconogon.
Sec. XI. Tiniaria.

EXTRA-INDIAN LATITUDINAL DISTRIBUTION.

26 Endemic species.

Species distributed westwards.

To Western Asia only	5	(8) Polygonum salicornioides *Jaub. & Spach.* (11) Polygonum setosum *Jaub. & Spach.* (12) Polygonum tubulosum *Boiss.* (13) Polygonum polycnemoides *Jaub. & Spach.* (14) Polygonum afghanicum *Meisn.*
To Northern Asia only	1	(22) Polygonum sphærostachyum *Meisn.*
To Northern and Western Asia only	3	(6) Polygonum cognatum *Meisn.* (7) Polygonum paronychioides *C. A. Mey* (15) Polygonum molliæforme *Boiss.*
To Western Asia and Europe	1	(42) Polygonum mite *Schrank.*
To Northern Asia, Europe, North America	1	(1) Polygonum islandicum *Hook. f.*
To Northern and Western Asia, Europe, Africa.	2	(10) Polygonum Bellardi *All.* (77) Polygonum Convolvulus *Linn.*
To Africa only	1	(19) Polygonum limbatum *Meisn.*

14 Total of species distributed westwards.

Species distributed eastwards.

To China only	7	(24) Polygonum paleaceum *Wall.* (26) Polygonum amplexicaule *Don.* (37) Polygonum viscosum *Don.* (49) Polygonum microcephalum *Don.* (51) Polygonum sphærocephalum *Wall.* (54) Polygonum capitatum *Ham.* (57) Polygonum muricatum *Meisn.*
To Malay Archipelago only	1	(66) Polygonum paniculatum *Bl.*
To China and Malay Archipelago	5	(38) Polygonum stagninum *Ham.* (41) Polygonum Posumbu *Ham.* (52) Polygonum runcinatum *Ham.* (55) Polygonum chinense *Linn.* (59) Polygonum perfoliatum *Linn.*
To China and Australia	1	(62) Polygonum prætermissum *Hook. f.*
To China, Malay Archipelago and Australia	3	(17) Polygonum orientale *Linn.* (61) Polygonum strigosum *R. Br.* (64) Polygonum pedunculare *Wall.*
To China and Northern Asia	1	(74) Polygenum sibiricum *Laxm.*

18 Total of species distributed eastwards.

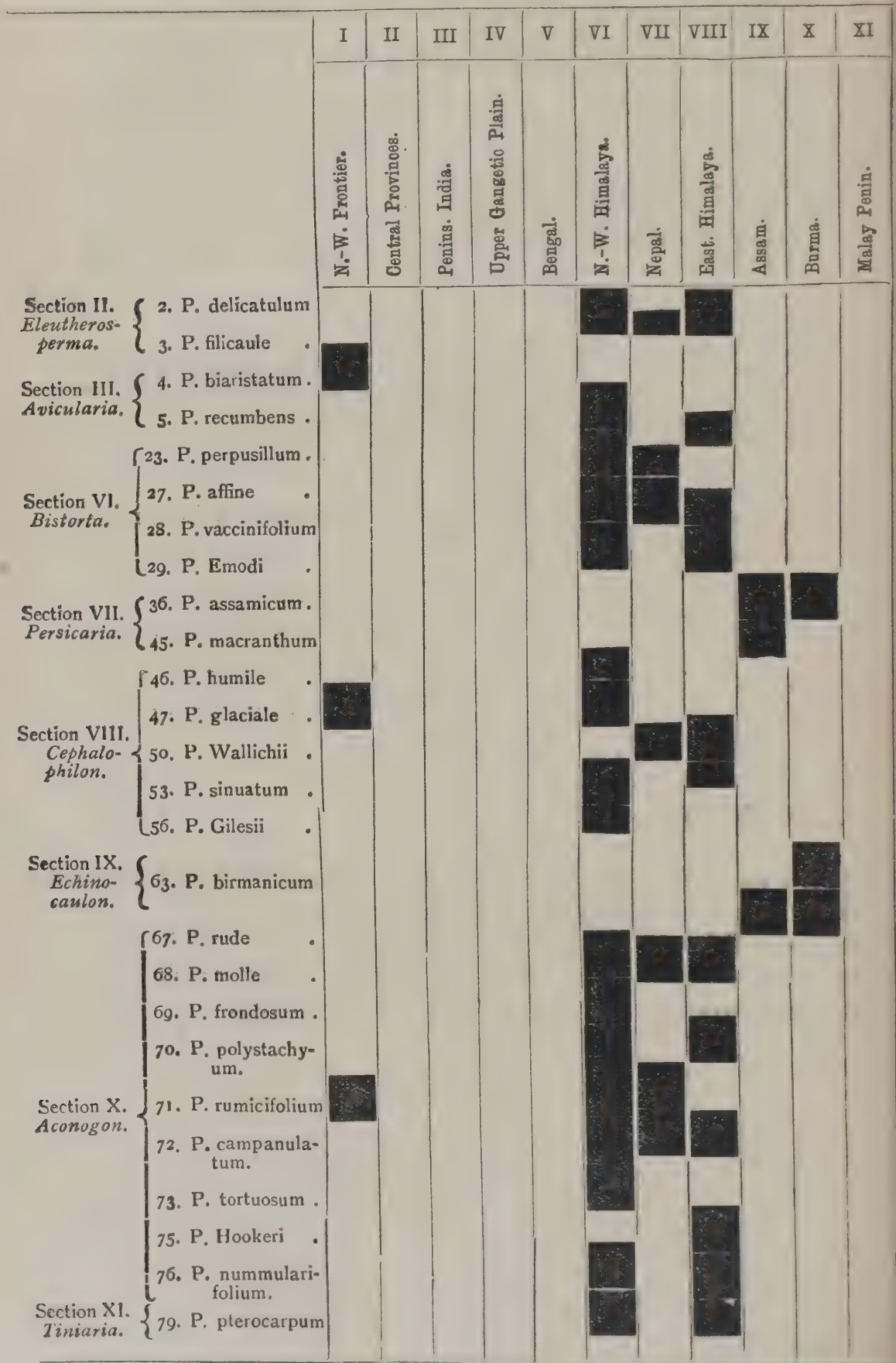
Species distributed eastwards and westwards.

To Malay Archipelago, China, Western Asia.	1	(44) Polygonum flaccidum *Meisn.*

To Malay Archipelago and Africa . .	1	(18) Polygonum tomentosum *Willd.*
To Malay Archipelago, China, and Africa	1	(48) Polygonum alatum *Ham.*
To Malay Archipelago, China, Africa, and Australasia	3	(16) Polygonum plebejum *R. Br.* (32) Polygonum lanigerum *R. Br.* (39) Polygonum barbatum *Linn.*
To China, North and Western Asia, Europe	1	(25) Polygonum Bistorta *Linn.*
To Australasia, Malay Archipelago, China Northern Asia, Europe . . .	1	(35) Polygonum minus *Huds.*
To China, North and Western Asia, Europe, Africa	1	(34) Polygonum Persicaria *Linn.*
To Malay Archipelago, China, Western Asia, Europe, Africa	1	(40) Polygonum serrulatum *Lagasc.*
To China, North Asia, Europe, North America	3	(21) Polygonum viviparum *Linn.* (65) Polygonum alpinum *All.* (78) Polygonum dumetorum *Linn.*
To China, North Asia, Europe, Africa, North America	2	(9) Polygonum aviculare *Linn.* (31) Polygonum amphibium *Linn.*
To Australasia, China, Africa, North and South America	1	(30) Polygonum glabrum *Willd.*
China, Northern Asia, North America .	1	(60) Polygonum sagittatum *Linn.*
China and North America . . .	2	(20) Polygonum virginianum *Linn.* (58) Polygonum arifolium *Linn.*
Cosmopolitan	2	(33) Polygonum lapathifolium *Linn.* (43) Polygonum Hydropiper *Linn.*
21	Total of Eastward and Westward species.	
79	Total of Indian species.	

All the species which are distributed to North America are confined to the east of the Rocky Mountains of that Continent, at first sight a curious fact, but one that is quite in accordance with the result established by Asa Gray, that the flora of North-East Asia has more affinities with that of North-East than that of North-West America.

Distribution of the Endemic Species.



It will be noticed that the endemic area is almost entirely restricted to the Himalayan range, four species going beyond it eastwards and three westwards.

The following tables give detailed lists of the Polygonums found in each sub-sub-area. By "species distributed to other sub-sub-areas" is meant species which are endemic to India as a whole, though not to the particular sub-sub-area in which they occur. By "species with an extra Indian distribution" is meant non-endemic Indian species which are found in the sub-sub-area considered.

I.—North-West Frontier.

		Section III.—Avicularia.
Species endemic to the sub-sub-area	1	(4) Polygonum biaristatum *Aitch. & Hemsley.*
		Section X.—Aconogon.
Species distributed to other sub-sub-areas	1	(71) Polygonum rumicifolium *Royle.*
		Section III.—Avicularia.
		(6) Polygonum cognatum *Meisn.* (7) Polygonum paronychioides *C. A. Mey.* (8) Polygonum salicornioides *Jaub. & Spach.* (9) Polygonum aviculare *Linn.* (10) Polygonum Bellardi *All.* (11) Polygonum setosum *Jaub. & Spach.* (12) Polygonum tubulosum *Boiss.* (13) Polygonum polycnemoides *Jaub. & Spach.* (14) Polygonum afghanicum *Meisn.* (16) Polygonum plebejum *R. Br.*
		Section VI.—Bistorta.
		(26) Polygonum amplexicaule *Don.*
Species with an extra-Indian distribution	23	*Section VII.—Persicaria.*
		(30) Polygonum glabrum *Willd.* (32) Polygonum lanigerum *R. Br.* (33) Polygonum lapathifolium *Linn.* (34) Polygonum Persicaria *Linn.* (39) Polygonum barbatum *Linn.* (40) Polygonum serrulatum *Lagasc.* (43) Polygonum Hydropiper *Linn.* (44) Polygonum flaccidum *Meisn.*
		Section VIII.—Cephalophilon.
		(47) Polygonum glaciale *Hook. f.* (48) Polygonum alatum *Ham.*
		Section XI.—Tiniaria.
		(77) Polygonum Convolvulus *Linn.* (78) Polygonum dumetorum *Linn.*

Total of North-West Frontier species: 25, or 31·6 per cent.

This sub-sub-area, so far as the genus Polygonum is concerned, is an extra-Indian extension of Boissier's oriental province. All except four of the species belong to either Persicaria or Avicularia. The species of the former section have a wide Indian and extra-Indian distribution both eastwards and westwards. The Avicularia section, however, is especially characteristic of this sub-sub-area, in which and in the drier districts of the North-West Himalaya the Indian contingent of Boissier's oriental Polygonums reach their eastermost limit, with the exception of the polymorphous *Polygonum plebejum*, and *Polygonum aviculare*; the former is found all over India, China and Australia, the latter reaches China.

II.—Central Provinces.

Species endemic to the sub-sub-area		No species.
Species distributed to other sub-sub-areas		No species.
Species with an extra-Indian distribution	5	*Section III.—Avicularia.* (16) Polygonum plebejum *R. Br.* *Section IV.—Amblygonon.* (18) Polygonum tomentosum *Willd.* (19) Polygonum limbatum *Meisn.* *Section VII.—Persicaria.* (30) Polygonum glabrum *Willd.* (39) Polygonum barbatum *Linn.*

Total of Central Provinces species: 5, or 6·33 per cent.

The true percentage is probably considerably higher than 6·33, but the Central Provinces are very poorly represented, so far as the genus under consideration is concerned, in the Calcutta Herbarium.

III.—Peninsular India.

Species endemic to the sub-sub-area		No species.
Species distributed too ther sub-sub-areas		No species.
Species with an extra-Indian distribution	14	*Section III.—Avicularia.* (16) Polygonum plebejum *R. Br.* *Section IV.—Amblygonon.* (18) Polygonum tomentosu m *Willd.* (19) Polygonum limbatum *Meisn.*

Species with an extra-Indian distribution 14

Section VII.—Persicaria.

(30) Polygonum glabrum *Willd.*
(35) Polygonum minus *Huds.*
(39) Polygonum barbatum *Linn.*
(40) Polygonum serrulatum *Lagasc.*
(43) Polygonum Hydropiper *Linn.*
(44) Polygonum flaccidum *Meisn.*

Section VIII.—Cephalophilon.

(48) Polygonum alatum *Ham.*
(51) Polygonum runcinatum *Ham.*
(55) Polygonum chinense *Linn.* *var.* ovalifolia.

Section IX—Echinocaulon.

(61) Polygonum strigosum *R. Br.*
(64) Polygonum pedunculare *Wall.*

Total of Peninsular India species: 14, or 17·7 per cent.

IV.—Upper Gangetic Plain.

Species endemic to the sub-sub-area — No species.

Species distributed to other sub-sub-areas . . . . . — No species.

Species with an extra Indian distribution 10

Section III.—Avicularia.

(16) Polygonum plebejum *R. Br.*

Section IV.—Amblygonon.

(17) Polygonum orientale *Linn.*
(19) Polygonum limbatum *Meisn.*

Section VII.—Persicaria.

(30) Polygonum glabrum *Willd.*
(32) Polygonum lanigerum *R. Br.*
(39) Polygonum barbatum *Linn.*
(40) Polygonum serrulatum *Lagasc.*
(41) Polygonum Posumbu *Ham.*
(44) Polygonum flaccidum *Meisn.*

Section VIII.—Cephalophilon.

(48) Polygonum alatum *Ham.*

Total number of Gangetic plain species: 10, or 12·7 per cent.

V.—Bengal.

Species endemic to the sub-sub-area — No species.

Species distributed to other sub-sub-areas . . . . . — No species.

Species with an extra-Indian distribution 19

Section III.—Avicularia.

(16) Polygonum plebejum *R. Br.*

Section IV.—Amblygonon.

(17) Polygonum orientale *Linn.*
(18) Polygonum tomentosum *Willd.*
(19) Polygonum limbatum *Meisn.*

Section VII.—Persicaria.

Species with an extra-Indian distribution 19

(30) Polygonum glabrum *Willd.*
(32) Polygonum lanigerum *R. Br.*
(33) Polygonum lapathifolium *Linn.*
(35) Polygonum minus *Huds.*
(38) Polygonum stagninum *Ham.*
(39) Polygonum barbatum *Linn.*
(40) Polygonum serrulatum *Lagasc.*
(43) Polygonum Hydropiper *Linn.*
(44) Polygonum flaccidum *Meisn.*

Section VIII.—Cephalophilon.

(48) Polygonum alatum *Ham.*
(54) Polygonum capitatum *Ham.*
(55) Polygonum chinense *Linn.* *var.* ovalifolia.

Section IX.—Echinocaulon.

(59) Polygonum perfoliatum *Linn.*
(61) Polygonum strigosum *R. Br.*
(64) Polygonum pedunculare *Wall.*

Total number of Bengal species: 19, or 24 per cent.

VI.—North-West Himalaya.

Species endemic to the sub-sub-area . 4

Section III.—Aviculariа.

(5) Polygonum recumbens *Royle.*

Section VIII.—Cephalophilon.

(46) Polygonum humile *Meisn.*
(56) Polygonum Gilesii *Hemsley.*

Section X.—Aconogon.

(69) Polygonum frondosum *Meisn.*

Species distributed to other sub-sub-areas 16

Section II.—Eleutherosperma.

(2) Polygonum delicatulum *Meisn.*
(3) Polygonum filicaule *Wall.*

Section VI.—Bistorta.

(23) Polygonum perpusillum *Hook. f.*
(27) Polygonum affine *Don.*
(28) Polygonum vaccinifolium *Wall.*
(29) Polygonum Emodi *Meisn.*

Section VIII.—Cephalophilon.

(47) Polygonum glaciale *Hook. f.*
(51) Polygonum sphærocephalum *Wall.*
(53) Polygonum sinuatum *Royle.*

Species distributed to other sub-sub-areas—*contd.* 16

Section X.—Aconogon.

(69) Polygonum molle *Don.*
(70) Polygonum polystachyum *Wall.*
(71) Polygonum rumicifolium *Roy'e.*
(72) Polygonum campanulatum *Hook. f.*
(73) Polygonum tortuosum *Don.*
(76) Polygonum nummularifolium *Meisn.*

Section XI.—Tiniaria.

(79) Polygonum pterocarpum *Wall.*

Species with an extra-Indian distribution 39

Section I.—Koenigia.

(1) Polygonum islandicum *Hook. f.*

Section III.—Aviculuria.

(6) Polygonum cognatum *Meisn.*
(7) Polygonum paronychioides *C. A. Mey.*
(9) Polygonum aviculare *Linn.*
(11) Polygonum setosum *Jaub. & Spach.*
(12) Polygonum tubulosum *Boiss.*
(13) Polygonum polycnemoides *Jaub. & Spach.*
(15) Polygonum molliæforme *Boiss.*
(16) Polygonum plebejum *R. Br.*

Section IV.—Amblygonon.

(17) Polygonum orientale *Linn.*

Section V.—Tovara.

(20) Polygonum virginianum *Linn.*

Section VI.—Bistorta.

(21) Polygonum viviparum *Linn.*
(22) Polygonum sphærostachyum *Meisn.*
(25) Polygonum Bistorta *Linn.*
(25) Polygonum amplexicaule *Don.*

Section VII.—Persicaria.

(30) Polygonum glabrum *Willd.*
(31) Polygonum amphibium *Linn.*
(32) Polygonum lanigerum *R. Br.*
(33) Polygonum lapathifolium *Linn.*
(34) Polygonum Persicaria *Linn.*
(35) Polygonum minus *Huds.*
(38) Polygonum stagninum *Ham.*
(39) Polygonum barbatum *Linn.*
(40) Polygonum serrulatum *Lagasc.*
(41) Polygonum Posumbu *Ham.*
(42) Polygonum mite *Schrank.*
(43) Polygonum Hydropiper *Linn.*
(44) Polygonum flaccidum *Meisn.*

Section VIII.—Cephalophilon.

(48) Polygonum alatum *Ham.*
(54) Polygonum capitatum *Ham.*
(55) Polygonum chinense *Linn.*

Section IX.—Echinocaulon.

(59) Polygonum perfoliatum *Linn.*
(60) Polygonum sagittatum *Linn.*
(61) Polygonum strigosum *R. Br.*

Section X.—Aconogon.

Species with an extra-Indian distribution 39

(65) Polygonum alpinum *All.*
(66) Polygonum paniculatum *Bl.*
(74) Polygonum sibiricum *Laxm.*

Section XI.—Tiniaria.

(77) Polygonum Convolvulus *Linn.*
(78) Polygonum dumetorum *Linn.*

Total number of North-West Himalaya species: 59, or 74·7 per cent.

This sub-sub-area has much the largest Polygonum population, and has the largest number of endemic species. It is the only sub-sub-area which has all eleven sections represented, and from its number of species and sections may be considered as the Polygonum head-quarters. The great variety of climates which this sub-sub-area enjoys is no doubt one of the chief causes of this wealth of species. To quote from Hooker and Thomson's essay, this sub-sub-area presents "a very gradual transition from the flora of Nepal to that of the arid Afghan hills. This is the case equally in the tropical, temperate, and alpine zones of vegetation, and in the interior as well as in the exterior Himalaya" We find the species of the section Avicularia confined chiefly to the inner drier districts, while other sections are more irregularly distributed over all the districts with a preponderance in the moister. The other sub-sub-areas to which the sixteen species mentioned above are distributed are entirely central or Eastern Himalayan, unless with the exception of the occurrence of that very doubtful variety *Wightiana* of *Polygonum sphærocephalum* in the Nilgiris.

VII.—NEPAL.

Species endemic to the sub-sub-area — No species.

Section II.—Eleutherosperma.

(3) Polygonum filicaule *Wall.*

Section VI.—Bistorta.

Species distributed to other sub-sub-areas 9

(27) Polygonum affine *Don.*
(28) Polygonum vaccinifolium *Wall.*

Section VIII.—Cephalophilon.

(50) Polygonum Wallichii *Meisn.*
(51) Polygonum sphærocephalum *Wall.*

Section X.—Aconogon.

Species distributed to other sub-sub-areas 9

(66) Polygonum paniculatum *Bl.*
(68) Polygonum molle *Don.*
(71) Polygonum rumicifolium *Royle.*
(72) Polygonum campanulatum *Hook. f. var.* fulvida.

Species with an extra-Indian distribution 17

Section III.—Avicularia.

(16) Polygonum plebejum *R. Br.*

Section VI.—Bistorta.

(22) Polygonum sphærostachyum *Meisn.*
(25) Polygonum Bistorta *Linn.*
(26) Polygonum amplexicaule *Don. var.* speciosa.

Section VII.—Persicaria.

(32) Polygonum lanigerum *R. Br.*
(35) Polygonum minus *Huds.*
(37) Polygonum viscosum *Ham.*
(39) Polygonum barbatum *Linn.*
(44) Polygonum flaccidum *Meisn. var.* hispida.

Section VIII.—Cephalophilon.

(48) Polygonum alatum *Ham.*
(49) Polygonum microcephalum *Don.*
(52) Polygonum runcinatum *Ham.*
(54) Polygonum capitatum *Ham.*
(55) Polygonum chinense *Linn. var.* ovalifolia.

Section IX.—Echinocaulon.

(57) Polygonum muricatum *Meisn.*
(59) Polygonum perfoliatum *Linn.*
(61) Polygonum strigosum *R. Br.*

Total of Nepal species : 26, or 33 per cent.

VIII.—Sikkim.

Section X.—Aconogon.

Species endemic to the sub-sub-area 1

(75) Polygonum Hookeri *Meisn.*

Species distributed to other sub-sub-areas 12

Section II.—Eleutherosperma.

(2) Polygonum delicatulum *Meisn.*
(3) Polygonum filicaule *Wall.*

Section VI.—Bistorta.

(23) Polygonum perpusillum *Hook f.*
(28) Polygonum vaccinifolium *Wall.*
(29) Polygonum Emodi *Meisn.*

Section VIII.—Cephalophilon.

(50) Polygonum Wallichii *Meisn.*
(53) Polygonum sinuatum *Royle.*

Species distributed to other sub-sub-areas 12

Section X.—Aconogon.

(68) Polygonum molle *Don.*
(70) Polygonum polystachyum *Wall.*
(72) Polygonum campanulatum *Hook. f.*
(73) Polygonum tortuosum *Don.*

Section XI.—Tiniaria.

(79) Polygonum pterocarpum *Wall.*

Species with an extra-Indian distribution 26

Section III.—Avicularia.

(16) Polygonum plebejum *R. Br.*

Section V.—Tovara.

(20) Polygonum virginianum *Linn.*

Section VI.—Bistorta.

(21) Polygonum viviparum *Linn.*
(22) Polygonum sphærostachyum *Meisn.*
(26) Polygonum amplexicaule *Don.*

Section VII.—Persicaria.

(30) Polygonum glabrum *Willd.*
(31) Polygonum amphibium *Linn.*
(33) Polygonum lapathifolium *Linn.*
(35) Polygonum minus *Huds.*
(39) Polygonum barbatum *Linn.*
(41) Polygonum Posumbu *Ham.*
(43) Polygonum Hydropiper *Linn.*
(44) Polygonum flaccidum *Meisn.*

Section VIII.—Cephalophilon.

(48) Polygonum alatum *Ham.*
(49) Polygonum microcephalum *Don.*
(52) Polygonum runcinatum *Ham.*
(54) Polygonum capitatum *Ham.*
(55) Polygonum chinense *Linn.*

Section IX.—Echinocaulon.

(57) Polygonum muricatum *Meisn.*
(58) Polygonum arifolium *Linn.*
(59) Polygonum perfoliatum *Linn.*
(61) Polygonum strigosum *R. Br.*
(62) Polygonum prætermissum *Hook. f.*

Section X.—Aconogon.

(66) Polygonum paniculatum *Bl.*
(74) Polygonum sibiricum *Laxm.*

Section XI.—Liniaria.

(77) Polygonum Convolvulus *Linn.*

Total number of Sikkim species: 39, or 50 per cent.

IX.—Assam.

Species endemic to the sub-sub-area. 2

Section VII.—Persicaria.

(36) Polygonum assamicum *Meisn.*
(45) Polygonum macranthum *Meisn.*

Species distributed to other sub-sub-areas 1

Section X.—Aconogon.

(67) Polygonum rude *Meisn.*.

Species with an extra-Indian distribution 29

Section III.—Avicularia.

(16) Polygonum plebejum *R. Br.*

Section IV.—Amblygonon.

(17) Polygonum orientale *Linn.*
(18) Polygonum tomentosum *Willd.*

Section V.—Tovara.

(20) Polygonum virginianum *Linn.*

Section VI.—Bistorta.

(24) Polygonum paleaceum *Wall.*

Section VII.—Persicaria.

(30) Polygonum glabrum *Willd.*
(32) Polygonum lanigerum *R. Br.*
(33) Polygonum lapathifolium *Linn.*
(35) Polygonum minus *Huds.*
(37) Polygonum viscosum *Ham.*
(38) Polygonum stagninum *Ham.*
(39) Polygonum barbatum *Linn.*
(40) Polygonum serrulatum *Lagasc.*
(41) Polygonum Posumbu *Ham.*
(43) Polygonum Hydropiper *Linn.*
(44) Polygonum flaccidum *Meisn.*

Section VIII.—Cephalophilon.

(48) Polygonum alatum *Ham.*
(49) Polygonum microcephalum *Don.*
(52) Polygonum runcinatum *Ham.*
(54) Polygonum capitatum *Ham.*
(55) Polygonum chinense *Linn.*

Section IX.—Echinocaulon.

(57) Polygonum muricatum *Meisn.*
(58) Polygonum arifolium *Linn.*
(59) Polygonum perfoliatum *Linn.*
(60) Polygonum sagittatum *Linn.*
(61) Polygonum strigosum *R. Br.*
(62) Polygonum prætermissum *Hook. f.*
(64) Polygonum pedunculare *Wall.*

Section X.—Aconogon.

(66) Polygonum paniculatum *Bl.*

Total number of Assam species: 32, or 40·5 per cent.

X.—Burma.

Section.—IX Echinocaulon.

Species endemic to the sub-sub-area 1

(63) Polygonum birmanicum *Gage*.

Section X.—Aconogon.

Species distributed to other sub-sub-areas 1

(67) Polygonum rude *Meisn*.

Species with an extra-Indian distribution 20

Section III.—Avicularia.

(16) Polygonum plebejum *R. Br.*

Section IV.—Amblygonon.

(17) Polygonum orientale *Linn.*
(18) Polygonum tomentosum *Willd.*
(19) Polygonum limbatum *Meisn.*

Section V.—Tovara.

(20) Polygonum virginianum *Linn.*

Section VI.—Bistorta.

(24) Polygonum paleaceum *Wall.*

Section VII.—Persicaria.

(30) Polygonum glabrum *Willd.*
(32) Polygonum lanigerum *R. Br.*
(33) Polygonum lapathifolium *Linn.*
(35) Polygonum minus *Huds.*
(37) Polygonum viscosum *Ham.*
(38) Polygonum stagninum *Ham.*
(39) Polygonum barbatum *Linn.*
(40) Polygonum serrulatum *Lagasc.*
(43) Polygonum Hydropiper *Linn.*
(44) Polygonum flaccidum *Meisn.*

Section VIII.—Cephalophilon.

(48) Polygonum alatum *Ham.*
(55) Polygonum chinense *Linn.*

Section IX.—Echinocaulon.

(59) Polygonum perfoliatum *Linn.*
(61) Polygonum strigosum *R. Br.*

Total of Burmese species: 22, or 27·8 per cent.

XI.—Malay Peninsula and Andamans.

Species endemic to the sub-sub-area		No species.
Species distributed to other sub-sub-areas		No species.
Species with an extra-Indian distribution	11	*Section III.—Avicularia.* (16) Polygonum plebejum *R. Br.* *Section IV.—Amblygonon.* (18) Polygonum tomentosum *Willd.* *Section VII.—Persicaria.* (35) Polygonum minus *Huds.* (38) Polygonum stagninum *Ham.* (39) Polygonum barbatum *Linn.* (40) Polygonum serrulatum *Lagasc.* (43) Polygonum Hydropiper *Linn.* (44) Polygonum flaccidum *Meisn.* *Section VIII.—Cephalophilon.* (55) Polygonum chinense *Linn.* *Section IX.—Echinocaulon.* (61) Polygonum strigosum *R. Br.* (64) Polygonum pedunculare *Wall.*

Total of Malay Peninsula species: 11, or 14 per cent.

The following table shows the 'sectional' distribution of the genus in the various sub-sub-areas. The figure in any given square is the number of species belonging to the section indicated horizontally and found in the sub-sub-area indicated vertically.

Sectional Distribution of the Genus in India.

		I. North-West. Frontier.	II. Central Provinces.	III. Penins. India.	IV. Upper Gangetic Plain.	V. Bengal.	VI. North-West. Himalaya.	VII. Nepal.	VIII. East Himalaya.	IX. Assam.	X. Burma.	XI. Malay Penins.	Total number of Indian species in each section.
Section I	*Koenigia* Hook. f.	...	...	...	...	...	1	...	...	...	...	...	*1*
Section II	*Eleutherosperma* Hook. f.	...	...	...	...	...	2	1	2	...	...	...	*2*
Section III	*Avicularia* Meisn.	11	1	1	1	1	9	1	1	1	1	1	*13*
Section IV	*Amblygonon* Meisn.	...	2	2	2	3	1	...	...	2	3	1	*3*
Section V	*Tovara* A. Gray	...	...	...	...	...	1	...	1	1	1	...	*1*
Section VI	*Bistorta* Tourn.	1	...	...	...	...	8	5	6	1	1	...	*9*
Section VII	*Persicaria* Meisn.	8	2	6	6	9	13	5	8	13	10	6	*16*
Section VIII	*Cephalophilon* Meisn.	2	...	3	1	3	8	7	7	5	2	1	*11*
Section IX	*Echinocaulon* Meisn.	...	...	2	...	3	3	3	5	7	3	2	*8*
Section X	*Aconogon* Meisn.	1	...	...	...	...	10	4	7	2	1	...	*12*
Section XI	*Tiniaria* Meisn.	2	...	...	...	...	3	...	2	...	...	...	*3*
	TOTAL	25	5	14	10	19	59	26	39	32	22	11	*79*

In the foregoing table it will be noticed that *Koenigia* has the smallest number of species and is least widely distributed in India, while *Persicaria* has the greatest number of species and is most widely distributed. *Avicularia* is especially distinctive to the North-West Frontier and the North-West Himalaya. *Bistorta*, *Cephalophilon*, *Aconogon*, and *Tiniaria* are characteristic of the Himalayan range from west to east. *Amblygonon* is practically restricted to the sub-sub-areas of low altitude. *Echinocaulon* is strongly represented in Assam.

Altitudinal Distribution in India.

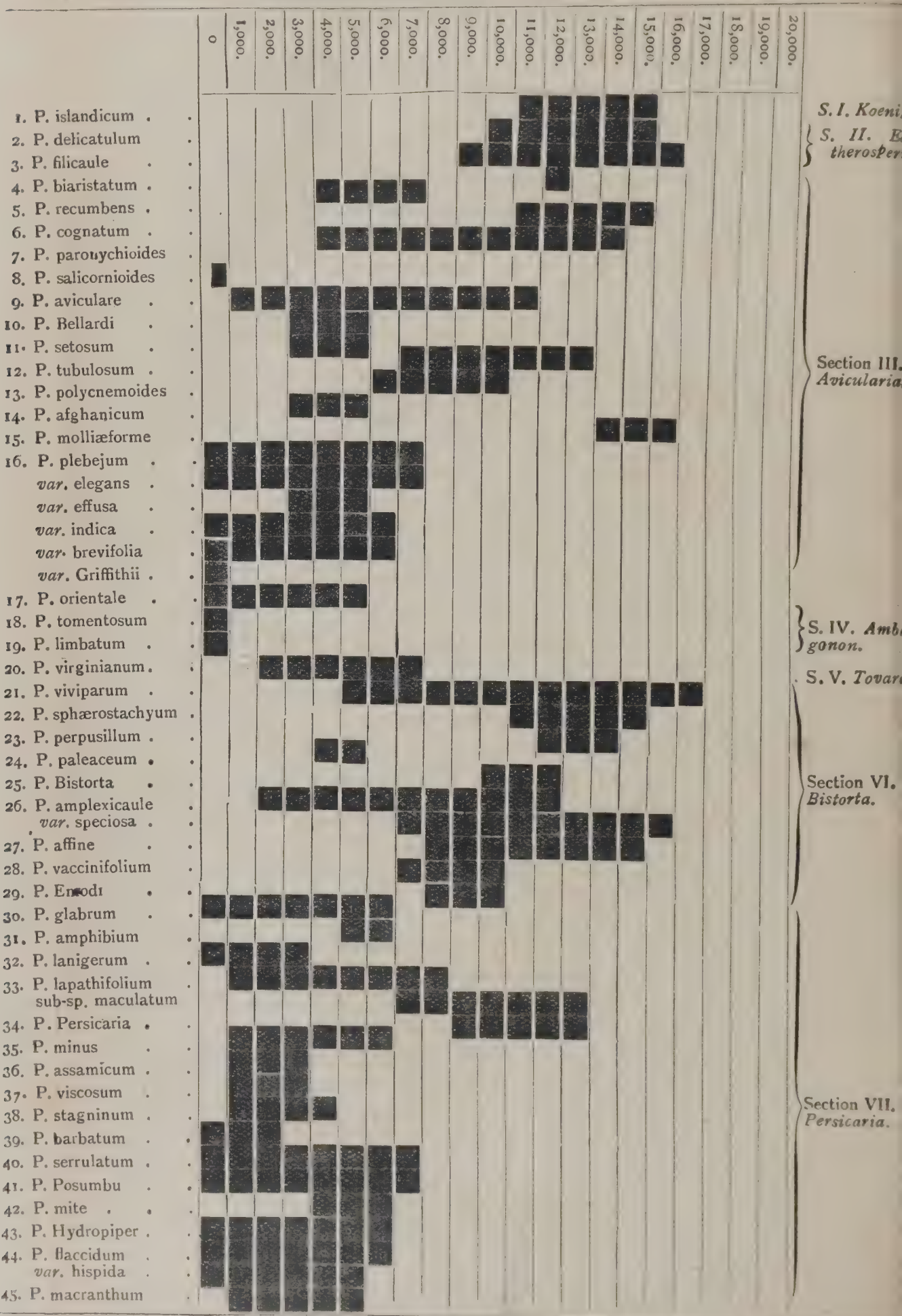
The following diagram gives the altitudinal range of every species with the more important varieties occurring in India. Each of the squares represents one thousand feet vertically as indicated on the left margin. Any further facts regarding the altitudinal range of any species can easily be incorporated by the reader simply 'inking in' the appropriate squares. The diagram is not of course likely to be absolutely correct for every species but the range of error probably does not go much beyond five hundred feet either way.

The species with the greatest vertical range is (21) *Polygonum viviparum* Linn., which is found from 5,000 feet up to 18,000 feet. Several species have a very restricted range. Of these among the more alpine forms are (15) *Polygonnm molliæforme* Boiss., (23) *Polygonum perpusillum* Hook. f., (25) *Polygonum Bistorta* Linn., (75) *Polygonum Hookeri* Meisn., and (76) *Polygonum nummularifolium* Meisn. Amongst the low-level species (18) *Polygonum tomentosum* Willd., (19) *Polygonum limbatum* Meisn., and (64) *Polygonum pedunculare* Wall., may be singled out.

The study of the altitudinal range of some of the varieties of *Polygonum plebejum* R. Br. lends some additional support to the writer's opinion, based on morphological grounds, that some of those varieties might well be raised to specific rank. It is seen that *Polygonum plebejum* and its variety *elegans* have the same vertical range, while the varieties *indica* and *brevifolia* are also altitudinal twins. On the other hand the variety *Griffithii* has a distinctly restricted range; *Polygonum tomentosum* and *Polygonum limbatum*, which are so remarkably like each other morphologically, are also linked by their latitudinal and altitudinal distribution.

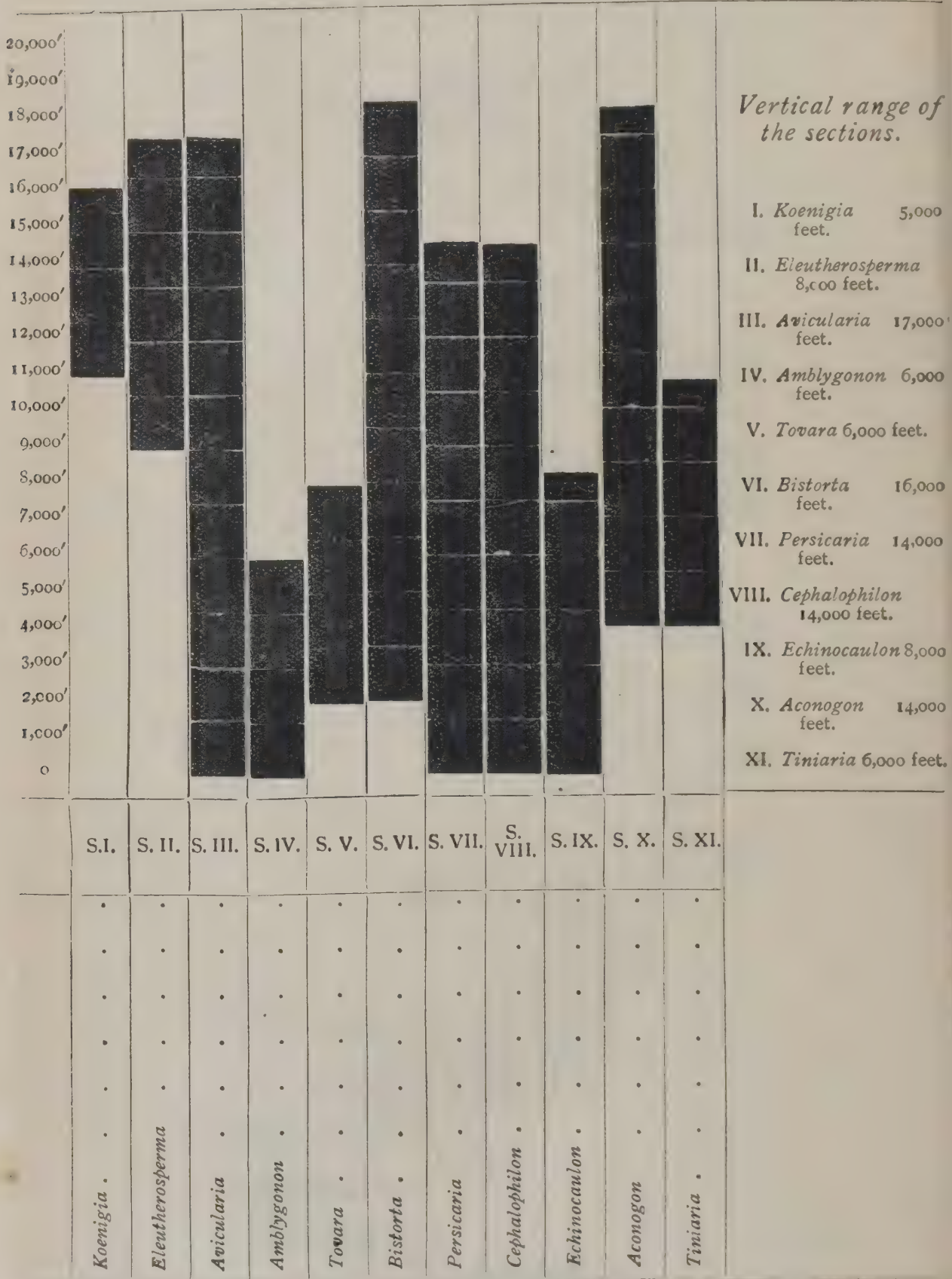
The diagram of general altitudinal distribution is followed by a similar one for the sections. The pages containing the former are to be held sideways.

Altitudinal distribution of species in India.



Altitudinal distribution of species in India.

Altitudinal range of the sections.



Vertical range of the sections.

I. *Koenigia* 5,000 feet.

II. *Eleutherosperma* 8,000 feet.

III. *Avicularia* 17,000 feet.

IV. *Amblygonon* 6,000 feet.

V. *Tovara* 6,000 feet.

VI. *Bistorta* 16,000 feet.

VII. *Persicaria* 14,000 feet.

VIII. *Cephalophilon* 14,000 feet.

IX. *Echinocaulon* 8,000 feet.

X. *Aconogon* 14,000 feet.

XI. *Tiniaria* 6,000 feet.

INDEX.

[Species described are in heavier type.]

PAGE.

A

Abrus precatorius . . 6, 96, 241, 259, 298
Abutilon graveolens 244, 288
Abutilon indicum . 6, 83, 177, 244, 288
Abutilon muticum 177
Abutilon polyandrum . . . 83
Acacia arabica . . 6, 101, 181, 244, 304
Acacia Catechu 6, 101
Acacia concinna . . . 232, 254, 305
Acacia Farnesiana 7, 101
Acacia Intsia . . 7, 101, 232, 254, 305
Acacia leucophlœa 181
Acacia pennata 7, 101
Acacia speciosa 7
Acacia tomentosa . . 232, 254, 304
Acalypha indica . . 188, 242, 259, 338
Acanthephippium sp. 141
Acanthus ebracteatus . . 327
Acanthus ilicifolius . 243, 246, 247, 248, 251, 256, 258, 261, 327
Acanthus volubilis 256, 327
Achimenes sp. 7
Achras Sapota 7, 115
Achyranthes aspera . . . 7, 132, 187
Achyranthes bidentata . . 132
Achyranthes ferruginea . . 333
Achyranthes triandra . . . 333
Aconitum heterophyllum . . 7, 77
Acorus Calamus 7
Acrocephalus capitatus . . 7, 130
Acrostichum aureum . 240, 254, 256, 261, 364
Acrostichum emarginatum . . 364
Acrostichum palustre . . . 364
Acrostichum scandens . . 254, 364
Actinopteris radiata . . . 157
Adenostemma viscosum . . 7, 111
Adhatoda Vasica . . . 7, 128
Adiantum caudatum . . . 156
Adiantum lunulatum . 7, 156, 242, 259, 361
Adina cordifolia 7, 108
Ægialitis 247, 261
Ægialitis annulata . . . 239, 243
Ægialitis rotundifolia . . 316
Ægiceras 248, 261

PAGE

Ægiceras majus . . . 243, 247, 316
Aeginetia indica . . . 7, 124
Ægle Marmelos 7, 87, 178, 240, 241, 259, 292
Æluropus villosus . . . 195
Ærides multiflorum . . . 140
Ærides odoratum . . . 7, 140
Ærides radiatum . . . 342
Ærua lanata 8, 132, 187
Ærua Monsonia . . . 132
Ærua scandens . . . 132
Æschynomene aspera . . 94
Æschynomene grandiflora . . 297
Æschynomene indica . . . 94
Afzelia retusa 303
Agaricus sp. 8
Agave americana . . . 8, 189
Agave Cantula 143, 189
Agave rigida 143
Ageratum conyzoides . 111, 244, 245, 261, 314
Ageratum cordifolium . . 314
Aglaia Roxburghiana . . 89
Aglaia undulata . . . 8
Agrostis Matrella . . . 357
Agrostis tenacissima . . . 359
Agyneia bacciformis . . 241, 260, 266, 336
Ailanthus excelsa . . . 8, 88
Ajuga disticha 332
Ajuga macrosperma . . . 8, 131
Alangium Lamarckii . . . 8, 108, 182
Albizzia Lebbek . . . 8, 101
Albizzia myriophylla . . . 8
Albizzia ordoratissima . . 8, 101
Albizzia procera . . . 101
Albizzia stipulata . . . 8, 101
Aldrovanda 243
Aldrovanda verticillata . . 305
Aldrovanda vesiculosa . . 232, 305
Alectra indica 124
Alectra Thomsoni . . . 124
Alisma reniforme . . . 8, 147
Allamanda sp. 8
Allium sp. 8
Allium Cepa 144
Allmania nodiflora . . . 8, 132
Allophylus Cobbe . . 232, 245, 257, 295

	PAGE.
Alocasia fornicata	147
Alocasia indica	8, 147
Alocasia macrorhiza	147
Aloysia citriodora	8, 128
Alpinia Allughas	244, 254, 345
Alpinia Galanga	142
Alsophila glabra	156
Alstonia scholaris	8
Alternanthera sessilis	9, 132, 187, 333
Althæa rosea	9, 83
Alysicarpus bupleurifolius	95
Alysicarpus monilifer	95
Alysicarpus rugosus	9, 95, 180
Alysicarpus vaginalis	9, 95
Amarantus Blitum	132
Amarantus caudatus	132
Amarantus frumentaceus	332
Amarantus gangeticus	9, 132, 187
Amarantus margostanus	132
Amarantus paniculatus	9, 132, 187, 244, 332
Amarantus polygamus	187, 244, 332
Amarantus polygonoides	332
Amarantus spinosus	9, 132, 187
Amarantus tristis	9
Amarantus viridis	132, 244, 332
Ambrosinia ciliata	349
Ammannia	243, 261
Ammannia baccifera	9, 104
Ammannia dentelloides	104
Ammannia multiflora	9, 104
Ammannia pentandra	9, 104
Ammannia peploides	9 104
Ammannia pygmæa	104
Ammannia salicifolia	309
Amomum dealbatum	142
Amomum melegueta	9
Amoora cucullata	240, 248, 250, 292
Amoora Rohituka	9, 89
Amorphophallus bulbifer	147, 192
Amorphophallus campanulatus	10, 147, 192
Ampelopsis quinquefolia	10, 91
Anagallis arvensis	114
Ananas sativa	10
Andersonia cucullata	292
Andrographis echioides	127
Andrographis paniculata	10, 127
Andropogon acicularis	154
Andropogon aciculatus	241, 359
Andropogon annulatus	10, 154
Andropogon assimilis	153
Andropogon brevifolius	153
Andropogon caricosus	154
Andropogon citriodorus	154
Andropogon Clarkei	154
Andropogon contortus	10, 154
Andropogon exilis	153
Andropogon fascicularis	153
Andropogon fastigiatus	153
Andropogon foveolatus	153
Andropogon glaber	359
Andropogon Gryllus	10, 154
Andropogon halepensis	153
Andropogon intermedius	153, 247, 256, 359
Andropogon lancearius	154
Andropogon micranthus	153
Andropogon montanus	10
Andropogon monticola	154
Andropogon muricatus	358
Andropogon pertusus	10, 153
Andropogon polyphyllus	154
Andropogon Schœnanthus	10, 154
Andropogon serratus	10, 154
Andropogon Sorghum	153, 195
Andropogon squarrosus	154, 244, 358
Aneilema	257
Aneilema Hamiltonianum	145
Aneilema lineolatum	145
Aneilema nudiflorum	11, 145, 246, 345
Aneilema scapiflorum	145
Aneilema spiratum	145
Aneilema vaginatum	145
Angelica glauca	11
Angelonia grandiflora	244, 325
Angiopteris evecta	11, 158
Anisochilus carnosus	11, 130
Anisomeles ovata	11, 131, 242, 259, 332
Anogeissus acuminata	11, 103
Anogeissus latifolia	11, 103
Anona reticulata	11, 78
Anona squamosa	11, 78, 176
Anotis calycina	11, 109
Anthistiria ciliata	154
Anthistiria gigantea	154
Anthistiria imberbis	154
Anthocephalus Cadamba	11, 108
Antidesma acuminatum	11, 137
Antidesma Bunius	11, 137
Antidesma diandrum	11, 137
Antidesma Ghesæmbilla	11, 136 241, 259, 337
Antidesma paniculatum	337
Antidesma pubescens	337
Antigonon leptopus	11, 133
Aphania Danura	243, 259, 295
Apium graveolens	12, 107
Apluda varia	12, 154
Apocopis Wightii	153
Aponogeton monostachyum	147
Arachis hypogæa	12, 95
Ardisia humilis	12, 115
Areca Catechu	12, 145, 244, 347
Argemone mexicana	12, 79
Argyreia Daltoni	12, 119
Argyreia nervosa	12, 119
Argyreia speciosa	119

	PAGE.
Argyreia tiliæfolia	322
Arisæma Murrayi	192
Arisæma tortuosum	146, 192
Aristida adscenscionis	154
Aristida Cumingiana	12, 154
Aristida redacta	154
Aristida setacea	154
Aristolochia bracteata	133
Aristolochia indica	12, 246, 257, 334
Artemisia maderaspatana	314
Artemisia parviflora	13, 113
Arthraxon ciliaris	153
Arthraxon lanceolatus	153
Arthraxon microphyllus	153
Arthrocnemum	247
Arthrocnemum indicum	231, 256, 333
Artocarpus incisa	13
Artocarpus integrifolia	13, 139
Artocarpus Lakoocha	13, 139
Arundinaria Wightiana	195
Arundinella setosa	152
Arundinella tenella	152
Arundinella sp.	13
Arundinella Wallichii	152
Arundo Donax	13, 155
Arundo Karka	360
Asclepias Curassavica	117
Asclepias echinata	319
Asclepias gigantea	318
Asclepias microphylla	319
Asclepias parasitica	320
Asclepias pseudosarsa	318
Asclepias rosea	318
Asclepias tenuissima	320
Asclepias volubilis	320
Asparagus racemosus	13, 144, 190
Asphodelus clavatus	345
Asphodelus tenuifolius	144, 232, 244, 345
Asplenium bipinnatum	362
Asplenium drepanophyllum	13, 157
Asplenium esculentum	157, 244, 261, 362
Asplenium falcatum	254, 362
Asplenium Filix-fœmina	157
Asplenium laciniatum	157
Asplenium oxyphyllum	13
Atragene zeylanica	285
Atylosia crassa	98
Atylosia mollis	14
Atylosia scarabæoides	14, 98, 241, 259, 300
Avena sativa	14, 155
Averrhoa Carambola	14, 87
Avicennia	247, 249
Avicennia alba	331
Avicennia officinalis	243, 248, 261, 330
Avicennia tomentosa	330
Axonopus cimicinus	14, 151
Axonopus semialatus	151
Azima	260
Azima tetracantha	241, 266, 317
Azolla pinnata	158

B

Baliospermum axillare	14, 137
Bambusa sp.	14
Bambusa arundinacea	156, 196
Bambusa vulgaris	156
Barleria cristata	16, 127
Barleria Prionitis	16, 127
Barleria strigosa	16, 127
Barringtonia acutangula	16, 261, 308
Barringtonia racemosa	246, 247, 258, 308
Basella	261
Basella alba	334
Basella rubra	16, 133, 244, 334
Bassia latifolia	16, 115, 183
Bassia longifolia	183
Bauhinia acuminata	16, 100
Bauhinia malabarica	100
Bauhinia purpurea	16, 100
Bauhinia racemosa	16, 100, 181
Bauhinia retusa	16, 100
Bauhinia tomentosa	16, 100
Bauhinia Vahlii	16, 100
Bauhinia variegata	16, 107
Beaumontia grandiflora	17, 110
Begonia picta	17
Belamcanda chinensis	142
Benincasa cerifera	17, 106
Berberis asiatica	79
Bergera integerrima	291
Bergia ammannioides	82
Beta vulgaris	132
Bidens pilosa	18, 112
Bignonia venusta	18, 125
Biophytum Reinwardtii	87
Biophytum sensitivum	18, 87
Bischofia javanica	136
Bixa Orellana	18, 81
Blainvillea latifolia	112
Blechnum orientale	157
Blepharis bœrhaaviæfolia	127
Blepharis molluginifolia	127
Blumea amplectens	241, 260, 266, 314
Blumea fasciculata	18
Blumea glomerata	18, 111
Blumea Jacquemontii	111
Blumea lacera	18, 111
Blumea laciniata	111
Blumea membranacea	111
Blumea oxyodonta	111
Blumea Wightiana	111
Blyxa oryzetorum	140
Blyxa Roxburghii	140

	PAGE.
Bœhmeria platyphylla	139
Bœrhaavia diffusa	18
Bœrhaavia repanda	186
Bœrhaavia repens	131, 186
Bombax malabaricum	18, 84, 177
Bonnaya brachiata	18, 124
Bonnaya veronicæfolia	124
Borassus flabellifer	19, 146, 192
Boswellia serrata	19, 88
Bouea burmanica	240, 241, 259, 296
Bougainvillea glabra	131
Bougainvillea spectabilis	20
Brassica alba	80
Brassica campestris	19, 79
Brassica juncea	19, 80
Brassica nigra	79
Brassica oleracea	79
Breynia patens	19
Breynia rhamnoides	19, 136, 242, 259, 337
Bridelia montana	135
Bridelia retusa	19, 135, 188
Bridelia scandens	336
Bridelia stipularis	135, 232, 243, 259, 336
Bridelia tomentosa	19, 135
Brownlowia	248, 256
Brownlowia lanceolata	290
Bruguiera gymnorhiza	230, 251, 307
Bruguiera parviflora	231, 307
Bryonia laciniosa	19, 106
Bryophyllum calycinum	19, 102
Buchanania latifolia	19, 92
Buchnera hispida	19, 124
Buddleia asiatica	118
Buettneria herbacea	20, 85, 177
Bulbophyllum triste	140
Bulbostylis barbata	149
Bupleurum falcatum	20
Bupleurum mucronatum	107
Burmannia cœlestis	20, 140
Bursera serrata	20, 88
Butea frondosa	20, 97, 180
Butea superba	20, 97
Butomopsis lanceolata	20, 147

C

Cæsalpinia Bonducella	20, 99, 246, 258, 261, 301
Cæsalpinia Coriaria	20, 99
Cæsalpinia cucullata	302
Cæsalpinia digyna	99
Cæsalpinia Nuga	243, 246, 254, 258, 261, 302
Cæsalpinia paniculata	302
Cæsalpinia pulcherrima	20, 99
Cæsalpinia Sappan	99
Cæsalpinia sepiaria	99
Cæsulia axillaris	20, 112
Cajanus indicus	20, 98
Calamintha umbrosa	131
Calamus acanthopis	222
Calamus acanthospathus	206
Calamus accedens	225
Calamus adspersus	210
Calamus albus	213
Calamus amarus	206, 217
Calamus amboinensis	226
Calamus americanus	217
Calamus amplectens	201
Calamus anceps	213
Calamus andamanicus	211
Calamus arborescens	198
Calamus aruensis	212
Calamus asperrimus	213, 217
Calamus aureus	215
Calamus axillaris	211
Calamus bacularis	206
Calamus barbatus	204
Calamus Barterii	199
Calamus Blancoi	204
Calamus Blumei	209
Calamus borneensis	201, 205
Calamus Bousigonii	209
Calamus brachystachys	215
Calamus Brandisii	206
Calamus brevifrons	204
Calamus Burckianus	198
Calamus buroënsis	203, 217
Calamus cæsius	211
Calamus calapparius	226
Calamus calolepis	213
Calamus caryotoides	202
Calamus castaneus	198
Calamus Cawa	213
Calamus ciliaris	208
Calamus cinnamomeus	217
Calamus cochinchinensis	217
Calamus collinus	197
Calamus concinnus	204
Calamus conirostris	215
Calamus corrugatus	201
Calamus crinitus	226
Calamus Cumingianus	210
Calamus Curag	217
Calamus cuspidatus	217
Calamus Cuthbertsonii	202
Calamus dealbatus	217
Calamus deerratus	199
Calamus delicatulus	206
Calamus densiflorus	205
Calamus Diepenhorstii	208
Calamus diffusus	206
Calamus digitatus	201
Calamus dilaceratus	198
Calamus dimorphacanthus	214
Calamus dioicus	201, 207

	PAGE.
Calamus discolor	213, 217
Calamus docilis	204
Calamus Doriæi	211
Calamus dongnaiensis	198
Calamus Draco	224
Calamus elongatus	226
Calamus epetiolaris	217
Calamus equestris	213
Calamus erectus	197
Calamus erioacanthus	213
Calamus exilis	208
Calamus extensus	203, 217
Calamus farinosus	217
Calamus fasciculatus	203
Calamus Feanus	206
Calamus Fernandezii	214
Calamus ferrugineus	216
Calamus filiformis	201
Calamus filipendulus	202
Calamus fissus	215, 219
Calamus flabellatus	201
Calamus flagellum	19
Calamus floribundus	204
Calamus formosanus	211
Calamus Gamblei	207
Calamus Gaudichaudii	226
Calamus giganteus	215
Calamus glaucescens	211
Calamus gonospermus	202
Calamus gracilis	204, 208
Calamus graminosus	213, 217
Calamus grandiflorus	217
Calamus Griffithianus	198
Calamus Guruba	207
Calamus Hankeanus	204
Calamus Hermandi	216
Calamus Helferianus	206
Calamus Heliotropium	206
Calamus Henryanus	199
Calamus heteracanthus	210
Calamus heteroideus	205
Calamus Heudelotii	199
Calamus hirsutus	226
Calamus hispidulus	209
Calamus Hollrungii	212
Calamus Hookerii	217
Calamus horrens	206, 212
Calamus hostilis	198
Calamus Huegelianus	207
Calamus humilis	217
Calamus hypoleucus	207
Calamus Imperatrice-Marie	218
Calamus inermis	211
Calamus insignis	215
Calamus interruptus	204
Calamus javensis	201
Calamus kandariensis	210
Calamus Kentiæformis	218
Calamus Korthalsii	226
Calamus lævis	218
Calamus latifolius	211
Calamus latispinus	218
Calamus Leprieurii	200
Calamus leptospadix	199
Calamus Lindenii	218
Calamus litoralis	203
Calamus Lobbianus	215
Calamus longepinna	217
Calamus longisetus	199
Calamus luridus	206
Calamus macracanthus	211
Calamus macrocarpus	197, 218
Calamus manaan	211
Calamus manicatus	226
Calamus Mannii	218
Calamus manillensis	215
Calamus marginatus	208
Calamus maritimus	217
Calamus Martianus	214
Calamus Mastersianus	207
Calamus mattanensis	216
Calamus maximus	215, 218
Calamus melanolepis	215
Calamus melanacanthus	208
Calamus melanochætes	211
Calamus melanolepis	207
Calamus melanoloma	213
Calamus Metzianus	217
Calamus Meyenianus	217
Calamus micranthus	215, 218
Calamus microcarpus	213
Calamus mishmeensis	204
Calamus mollis	204, 226
Calamus monoicus	205
Calamus montanus	205
Calamus Moseleyanus	211
Calamus mucronatus	213
Calamus Muellerii	202
Calamus multiflorus	204
Calamus muricatus	203
Calamus myrianthus	207
Calamus myriacanthus	214
Calamus neglectus	213
Calamus nematospadix	204
Calamus Newmannii	218
Calamus nicobaricus	205
Calamus Nicolai	218
Calamus nitidus	218
Calamus nutantiflorus	218
Calamus oblongus	212
Calamus opacus	205, 218
Calamus optimus	211
Calamus ornatus	215
Calamus ovoideus	211
Calamus Oxleyanus	214
Calamus pachystemonus	201

	PAGE.
Calamus pallidulus	211
Calamus palustris	211
Calamus papuanus	201
Calamus parvifolius	204, 218
Calamus paspalanthus	207
Calamus patanensis	218
Calamus penicillatus	214, 217
Calamus perakensis	207
Calamus Perrotetii	200
Calamus periacanthus	229
Calamus pilosellus	208
Calamus pisicarpus	212
Calamus platyspathus	207
Calamus platyacanthus	226
Calamus plicatus	210
Calamus polygamus	197, 217
Calamus pseudo-Rotang	203
Calamus pseudo-tenuis	204
Calamus pulcher	217
Calamus pygmaeus	205
Calamus quinquenervius	215
Calamus radiatus	201
Calamus radicalis	204
Calamus radulosus	203
Calamus ralumensis	217
Calamus ramosissimus	207
Calamus Regis	218
Calamus Reinwardtii	205
Calamus Rheedei	207
Calamus rhomboideus	209
Calamus Ridleyanus	205
Calamus rivalis	199
Calamus Rotang	206
Calamus Roxburghii	206
Calamus Royleanus	206
Calamus rudentum	199, 219
Calamus rugosus	203
Calamus Rumphii	226
Calamus ruptilis	230
Calamus ruvidus	202
Calamus salicifolius	206
Calamus sarawakensis	208
Calamus scabridulus	203
Calamus schistoacanthus	201
Calamus schizospathus	197
Calamus Schweinfurthii	200
Calamus Scipionum	206, 215
Calamus secundiflorus	200, 218
Calamus serrulatus	204
Calamus siamensis	203
Calamus simplex	211
Calamus singaporensis	208
Calamus siphonospathus	213
Calamus spathulatus	215
Calamus spectabilis	209
Calamus spinilifolius	202
Calamus stoloniferus	218
Calamus strictus	229
Calamus subinermis	212
Calamus symphysipus	210
Calamus tenuis	204, 206, 254, 347
Calamus tetradactylus	206
Calamus Thwaitesii	199
Calamus thysanolepis	216
Calamus tigrinus	199
Calamus tomentosus	209
Calamus travancoricus	207
Calamus trichrous	219
Calamus trinervis	218
Calamus unifarius	212
Calamus usitatus	204, 226
Calamus Verschaffeltii	218
Calamus verus	212, 217
Calamus Vidalianus	212
Calamus viminalis	146, 203, 217
Calamus viridispinus	213
Calamus Walkerii	206
Calamus Warburgii	217
Calamus Wightii	207
Calamus Zalacca	218
Calamus zebrinus	204
Calamus zeylanicus	210, 218
Calamus Zollingerii	199
Calamus zonatus	203
Callicarpa arborea	20, 129
Callicarpa macrophylla	21, 129
Callistemon linearis	21
Callitriche stagnalis	102
Calotropis gigantea	21, 117, 244, 318
Calotropis procera	117
Camellia theifera	21, 83
Canavalia ensiformis	21, 97, 180, 299
Canavalia lineata	245, 251, 299
Canavalia obtusifolia	299
Canavalia turgida	243, 251, 256, 261, 299
Canavalia virosa	97
Canna indica	21, 142
Cannabis sativa	138
Canscora decussata	21, 118
Canscora diffusa	21, 118
Canthium didymum	21, 109
Canthium parviflorum	182
Capparis horrida	21, 80
Capparis sepiaria	243, 245, 257, 258, 287
Capparis trifoliata	286
Capsicum frutescens	21, 122
Capsicum grossum	122
Capsicum minimum	122
Caralluma fimbriata	184
Carapa gangetica	248, 268
Carapa moluccensis	292
Carapa obovata	247, 293
Cardiospermum Halicacabum	21, 91, 178, 244, 295

	PAGE.
Carduus lanatus	315
Carex cruciata	150
Carex plebeja	150
Carex speciosa	150
Carex stramentitia	150
Careya arborea	21, 103
Carica Papaya	21, 105
Carissa Carandas	21, 115, 184
Carissa diffusa	22
Carissa spinarum	21, 116
Carpopogon giganteum	298
Carthamus tinctorius	22, 67, 113
Carum copticum	107
Carum Roxburghianum	107
Casearia graveolens	105
Casearia tomentosa	22, 105
Cassia Absus	100
Cassia auriculata	181
Cassia Fistula	22, 99, 180, 240, 241, 259, 302
Cassia glauca	22, 100
Cassia mimosoides	22, 100
Cassia obtusifolia	99
Cassia occidentalis	180
Cassia pumila	100
Cassia Sophera	99, 180, 246, 257, 303
Cassia Tora	22, 99, 181, 244, 303
Cassytha filiformis	22, 134, 246, 257, 334
Casuarina equisetifolia	244, 261, 340
Casuarina muricata	340
Cedrela Toona	22, 89
Celastrus paniculata	22, 89
Celosia argentea	22, 132, 186
Celosia cristata	132, 187
Celosia coromandeliana	123
Celtis orientalis	339
Centipeda orbicularis	22, 113
Centranthera hispida	22, 24
Centranthera humifusa	124
Centunculus tenellus	22, 114
Cephalandra	261
Cephalandra indica	106, 182, 244, 311
Cephalostachyum pergracile	156
Cephalostigma hirsutum	24, 114
Cephalostigma Hookeri	23, 114
Cephalostigma Schimperi	23, 114
Ceratophyllum	243
Ceratophyllum demersum	139, 341
Ceratophyllum verticillatum	341
Ceratopteris thalictroides	23, 157, 243, 362
Cerbera Odollam	247, 317
Ceriops	247, 250
Ceriops Candolleana	306
Ceriops Roxburghiana	306
Ceropegia bulbosa	184
Ceropegia hirsuta	117
Chamæraphis	243
Chamæraphis spinescens	356
Chara fœtida	23, 159
Cheilanthes farinosa	23, 157
Cheilanthes tenuifolia	23, 157
Chenopodium album	23, 132, 187
Chloris sp.	24
Chloris barbata	155, 244, 261, 359
Chloris delicatula	155
Chloris pallida	155
Chloris virgata	155
Chlorophytum arundinaceum	144
Chlorophytum tuberosum	190
Chrozophora plicata	24, 137, 244, 337
Chrysanthellum indicum	113
Chrysanthemum coronarium	24, 113
Chrysanthemum indicum	24
Cicer arietinum	24, 96
Cipadessa fruticosa	89
Cirrhopetalum	254
Cirrhopetalum Roxburghii	342
Cissampelos Pareira	24, 79
Cissus carnosa	295
Cissus quadrangularis	294
Citrullus vulgaris	106
Citrus aurantium	88
Citrus decumana	88
Citrus medica	88
Cladium	256
Cladium riparium	232, 247, 353
Cleisostoma	254
Cleisostoma ramosum	344
Cleistanthus collinus	24, 136
Clematis Gouriana	77
Clematis nutans	24, 77
Cleome monophylla	24, 80
Cleome pentaphylla	286
Cleome viscosa	24, 80, 176, 241, 259, 286
Clerodendron inerme	240, 246, 247, 256, 258, 261, 330
Clerodendron infortunatum	24, 129
Clerodendron neriifolium	246, 330
Clerodendron phlomoides	25, 129
Clerodendron serratum	25, 129, 186
Clerodendron Siphonanthus	25, 129, 243, 259, 330
Clerodendron Thomsoni	25, 129
Clitoria ternatea	25, 98
Cnicus arvensis	113, 244, 261, 315
Cocculus villosus	25, 78, 176
Cochlearia flava	80
Cochlospermum Gossypium	25, 81
Cocos nucifera	146, 244, 348
Codiæum variegatum	137
Cœlachne pulchella	153
Coffea arabica	25, 110
Coffea bengalensis	110

	PAGE.
Coix Lachryma-Jobi	25, 152, 195
Coldenia procumbens	119, 232, 244, 321
Colebrookia oppositifolia	25, 131
Coleus aromaticus	130
Coleus barbatus	130
Coleus scutellarioides	130
Colocasia antiquorum	25, 147
Colocasia nymphæifolia	147
Combretum decandrum	25, 103
Combretum extensum	103
Combretum nanum	103
Combretum ovalifolium	103
Commelina attenuata	145
Commelina bengalensis	25, 145, 191, 242, 259, 346
Commelina Hasskarlii	145
Commelina nudiflora	145, 191, 346
Commelina obliqua	145, 191
Commelina salicifolia	25, 145
Commelina suffruticosa	25, 145
Convolvulus gangeticus	322
Convolvulus paniculatus	323
Convolvulus pentanthus	25
Convolvulus Pes-capræ	323
Convolvulus pluricaulis	25, 121
Convolvulus repens	323
Convolvulus stipulaceus	323
Conyza semipinnatifida	261, 266, 314
Conyza stricta	25, 111
Corchorus acutangulus	86, 244, 290
Corchorus capsularis	25
Corchorus fascicularis	86
Corchorus fuscus	290
Corchorus olitorius	26, 86
Cordia Macleodii	26, 119
Cordia Myxa	26, 119, 185, 241, 259, 321
Cordia obliqua	119
Cordia Rothii	185
Cordyline terminalis	144
Coriandrum sativum	107
Coryza corymbosa	314
Cosmarium Logiense	159
Cosmos sulphureus	112
Costus speciosus	26, 142
Courtoisia cyperoides	149
Cratæva religiosa	259, 286
Cratæva Roxburghii	241
Crepis acaulis	113
Crepis japonica	113
Crinum	26, 248
Crinum asiaticum	246, 256, 258, 345
Crinum defixum	143
Crinum latifolium	143
Crinum toxicarium	345
Crotalaria alata	26, 93
Crotalaria albida	26, 93
Crotalaria angulosa	297
Crotalaria calycina	26, 93
Crotalaria juncea	26, 93
Crotalaria linifolia	93
Crotalaria medicaginea	93
Crotalaria mysorensis	93
Crotalaria orixensis	179
Crotalaria prostrata	26, 93
Crotalaria quinquefolia	93
Crotalaria retusa	245, 246, 257, 297
Crotalaria Saltiana	244, 245, 246, 257, 258, 297
Crotalaria sericea	93
Crotalaria striata	26, 99, 297
Crotalaria verrucosa	243, 244, 245, 246, 257, 258, 259, 297
Croton caudatus	137
Croton oblongifolius	26, 64, 137, 241, 259, 337
Croton plicatus	337
Croton Tiglium	137
Cryptocoryne	255, 261
Cryptocoryne ciliata	146, 244, 254, 266, 349
Cryptocoryne retrospiralis	146
Cryptocoryne spiralis	146
Cryptolepis Buchanani	26, 117
Cryptostegia grandiflora	27, 117
Cucumis	261
Cucumis Melo	27, 106
Cucumis sativus	106
Cucumis trigonus	106, 182, 244, 311
Cucurbita maxima	106
Cucurbita moschata	106
Cucurbita Pepo	106
Curculigo latifolium	27
Curculigo orchioides	143, 189
Curculigo recurvata	143
Curcuma Amada	142
Curcuma aromatica	142
Curcuma cæsia	142
Curcuma cordata	27
Curcuma longa	27, 142
Curcuma petiolata	27, 142
Curcuma reclinata	142
Curcuma Zedoaria	142
Cuscuta	254
Cuscuta chinensis	27
Cuscuta reflexa	27, 121, 247, 324
Cyamopsis psoraloides	94, 232, 244, 297
Cyanotis axillaris	27, 145, 191
Cyanotis cristata	27, 145
Cyanotis tuberosa	27, 145
Cyathocline lyrata	27
Cyclostemon assamicus	254, 337
Cymbella cymbiformis	159
Cymbidium triste	343
Cynanchum callialata	117
Cyathocline lyrata	111
Cynodon Dactylon	27, 155, 195
Cynoglossum denticulatum	27, 119

	PAGE.
Cynometra	248
Cynometra mimosoides	303
Cynometra ramiflora	303
Cyperus alopecuroides	27
Cyperus amabilis	148
Cyperus aristatus	148
Cyperus bulbosus	193
Cyperus compressus	148
Cyperus cuspidatus	148
Cyperus difformis	148
Cyperus distans	27
Cyperus exaltatus	149, 247, 256, 261, 351
Cyperus flavidus	148
Cyperus inundatus	266, 351
Cyperus Iria	27, 148
Cyperus malaccensis	351
Cyperus niveus	27
Cyperus nudus	351
Cyperus nutans	148
Cyperus Pangorei	351
Cyperus pertenuis	351
Cyperus polystachyus	350
Cyperus pumilus	27
Cyperus rotundus	28, 148
Cyperus scariosus	241, 351
Cyperus tegetiformis	246, 257, 351
Cyperus tegetum	28, 148
Cyperus umbellatus	351

D

Dædalacanthus nervosus	23, 126
Dædalacanthus purpurascens	28, 126
Dædalea, sp.	159
Dæmia extensa	117, 244, 261, 319
Dæmonorops acanthobolus	228
Dæmonorops accedens	224
Dæmonorops amboinensis	226
Dæmonorops angustifolius	219
Dæmonorops annulatus	227
Dæmonorops calapparius	226
Dæmonorops calicarpus	222
Dæmonorops cochleatus	223
Dæmonorops collariferus	227
Dæmonorops crinitus	226
Dæmonorops cristatus	228
Dæmonorops depressiusculus	225
Dæmonorops didymophyllus	224
Dæmonorops dissitophyllus	229
Dæmonorops diversispinus	229
Dæmonorops Draco	224
Dæmonorops Draconcellus	224
Dæmonorops elongatus	226
Dæmonorops erinaceus	225
Dæmonorops fasciculatus	214
Dæmonorops fissus	219
Dæmonorops Forbesii	227
Dæmonorops formicarius	226
Dæmonorops fuscus	226
Dæmonorops Gaudichaudii	226
Dæmonorops geniculatus	228
Dæmonorops gracilipes	225
Dæmonorops grandis *Kurz*	219
Dæmonorops grandis *Murt*	219
Dæmonorops Guruba	207
Dæmonorops hirsutus	226
Dæmonorops hypoleucus	207
Dæmonorops Hystrix	226
Dæmonorops imbellis	220
Dæmonorops intermedius	220
Dæmonorops (?) intumescens	222
Dæmonorops Jenkinsianus	218, 254, 266, 347
Dæmonorops Korthalsii	226
Dæmonorops Kunstlerii	226
Dæmonorops Kurzianus	219
Dæmonorops lampro'epis	223
Dæmonorops leptopus	225
Dæmonorops Lewisianus	221
Dæmonorops longipes	225, 229
Dæmonorops longispathus	230
Dæmonorops macrophyllus	227
Dæmonorops macropterus	223
Dæmonorops malaccensis	222
Dæmonorops Manii	219
Dæmonorops manillensis	215
Dæmonorops Margarithæ	220
Dæmonorops mattanensis	224
Dæmonorops melanochaetes	219
Dæmonorops micranthus	2
Dæmonorops microstachys	225
Dæmonorops microthamnus	221
Dæmonorops mirabilis	226
Dæmonorops monticolus	221
Dæmonorops Motleyi	224
Dæmonorops niger	223
Dæmonorops nutantiflorus	218
Dæmonorops oblongus	226
Dæmonorops oligophyllus	227
Dæmonorops oxycarpus	225
Dæmonorops palembanicus	219
Dæmonorops periacanthus	229
Dæmonorops petiolaris	221
Dæmonorops Pierreanus	220
Dæmonorops platyacanthus	226
Dæmonorops platyspathus	207
Dæmonorops propinquus	224
Dæmonorops pseudo-mirabilis	226
Dæmonorops pseudo-Sepal	220
Dæmonorops Rheedii	207
Dæmonorops Riedelianus	226
Dæmonorops ramosissimus	207
Dæmonorops ruber	224

	PAGE.
Dæmonorops Rumphii	226
Dæmonorops ruptilis	230
Dæmonorops Sabut	227
Dæmonorops scapigerus	228
Dæmonorops Sepal	220
Dæmonorops singalanus	219
Dæmonorops sparsiflorus	224
Dæmonorops stenophyllus	220
Dæmonorops strictus	229
Dæmonorops tabacinus	222
Dæmonorops trichrous	219
Dæmonorops ursinus	222
Dæmonorops vagans	226
Dæmonorops verticillaris	228
Dalbergia cultrata	28
Dalbergia lanceolaria	28, 99
Dalbergia latifolia	28, 99
Dalbergia monosperma	300
Dalbergia scandens	301
Dalbergia Sissoo	28, 98
Dalbergia spinosa	240, 247, 251, 256, 261, 300
Dalbergia torta	245, 248, 251, 256, 258, 300
Dalbergia volubilis	28, 99
Damasonium indicum	342
Dancus Carota	107
Datura fastuosa	28, 122
Datura Stramonium	28, 122
Davallia immersa	156
Davallia pulchra	156
Deeringia celosioides	131
Dendrobium	254
Dendrobium anceps	342
Dendrobium bicameratum	28, 140
Dendrobium calceolaria	29, 140
Dendrobium crepidatum	28, 140
Dendrobium formosum	28, 140
Dendrobium herbaceum	29, 140
Dendrobium macrostachyum	29, 140
Dendrobium moschatum	29
Dendrobium Pierardi	231, 342
Dendrobium regium	29, 140
Dendrobium transparens	29, 140
Dendrocalamus sericeus	156
Dendrocalamus strictus	29, 156, 196
Dentella repens	108
Derris scandens	99, 243, 245, 246, 248, 254, 255, 257, 258, 301
Derris sinuata	245, 301
Derris uliginosa	243, 248, 251, 256, 261, 301
Desmodium brachystachyum	95
Desmodium Cephalotes	29, 95
Desmodium diffusum	95
Desmodium gangeticum	29, 95
Desmodium gyrans	29
Desmodium gyroides	29
Desmodium latifolium	29, 95
Desmodium laxiflorum	95
Desmodium parvifolium	29, 95
Desmodium polycarpum	29, 95
Desmodium pulchellum	29, 95
Desmodium triflorum	29, 95
Desmodium umbellatum	232, 245, 258, 298
Dicliptera micrantha	128
Dicliptera Roxburghiana	30, 128
Didymocarpus pygmæa	125
Digera arvensis	30, 132, 187
Digitaria longiflora	150
Digitaria pedicillaris	150
Digitaria Royleana	150
Digitaria sanguinalis	150
Dillenia indica	30, 78
Dillenia pentagyna	30, 78, 176
Dimeria connivens	153
Dimeria ornithopoda	153
Dinebra arabica	195
Dioscorea alata	143
Dioscorea anguina	30, 143
Dioscorea belophylla	143
Dioscorea bulbifera	30
Dioscorea dæmona	30, 143
Dioscorea glabra	30, 143
Dioscorea globosa	143
Dioscorea Hamiltoni	30, 143
Dioscorea Hookeri	143
Dioscorea oppositifolia	30
Dioscorea pentaphylla	30, 143, 189, 242, 258, 345
Dioscorea sativa	30, 143, 189
Dioscorea Wallichii	30, 143
Diospyros cordifolia	316
Diospyros Embryopteris	30, 115, 240, 241, 259, 317
Diospyros glutinosa	317
Diospyros melanoxylon	30, 115
Diospyros montana	31, 115, 241, 259, 316
Diospyros tomentosa	115
Diospyros tupru	183
Diplachne fusca	244, 261, 361
Dischidia nummularia	247, 254, 320
Disporum pullum	144
Dodonæa viscosa	31, 92
Dolichandrone	256
Dolichandrone Rheedei	246, 247, 254, 257, 258, 326
Dolichos biflorus	31, 98, 180
Dolichos fabæformis	297
Dolichos gangeticus	299
Dolichos Lablab	31, 98
Dolichos obcordatus	299
Dolichos rotundifolius	299
Dolichos scarabæoides	300
Dopatrium junceum	31, 123
Dregea volubilis	31, 117, 184, 248, 254, 320

	PAGE.
Drosera Burmanni	31, 102
Drosera indica	102
Drymaria cordata	82
Drymoglossum	254
Drymoglossum piloselloides	364
Dumasia villosa	96
Duranta Plumieri	31, 128
Dysophylla cruciata	31, 130
Dysophylla pentagona	130
Dysophylla verticillata	31, 130

E

Echinops echinatus	32, 113
Eclipta alba	32, 112, 182
Ehretia lævis	32, 119, 185
Elæocarpus serratus	32, 86
Elaeodendron glaucum	32, 89
Eleocharis	261
Eleocharis congesta	149
Eleocharis fistulosa	32, 149
Eleocharis plantaginea	149
Eleocharis spiralis	352
Elephantopus scaber	32, 111
Eleusine ægyptiaca	32, 155, 195, 244, 360
Eleusine coracana	32, 155
Eleusine indica	32, 155, 244, 360
Elytraria crenata	126
Elytrophorus articulatus	32, 155
Embelia robusta	32, 114, 183
Emilia sonchifolia	32, 113
Entada Pursætha	254, 304
Entada scandens	32, 100, 304
Enterolobium Saman	101
Equisetum debile	32, 158
Eragrostis amabilis	32, 155
Eragrostis bifaria	32
Eragrostis brachyophylla	32
Eragrostis ciliaris	32
Eragrostis ciliata	32, 155
Eragrostis coarctata	155
Eragrostis coromandelina	33, 156
Eragrostis cynosuroides	33, 156
Eragrostis elegantula	33
Eragrostis elongata	156
Eragrostis gangetica	156
Eragrostis interrupta	33, 155, 195
Eragrostis major	33, 156
Eragrostis minor	156
Eragrostis nardoides	33, 156
Eragrostis nigra	33
Eragrostis pilosa	33, 156
Eragrostis stenophylla	33, 156
Eragrostis tenella	33, 155, 244, 360
Eragrostis tenuifolia	156
Eragrostis tremula	33, 156
Eria flava	140
Erianthus fastigiatus	153

	PAGE.
Erigeron asteroides	111
Eriobotrya japonica	33, 102
Eriocaulon luzulæfolium	33, 148
Eriocaulon oryzetorum	148
Eriocaulon quinqueangulare	148
Eriocaulon Sieboldianum	148
Eriocaulon trilobum	148
Eriocaulon truncatum	148
Eriocaulon xeranthemum	148
Eriochloa polystachya	150, 261, 354
Eriodendron anfractuosum	177
Eriolaena Hookeriana	33, 85
Eriolaena quinquelocularis	85
Eriolaena spectabilis	33
Eriosema chinense	33, 98
Eruca sativa	33, 80
Erycibe paniculata	33, 119
Erythræa Roxburghii	33
Erythrina indica	33, 97, 245, 251, 258, 298
Erythrina resupinata	97
Erythrina suberosa	97
Erythroxylon Coca	86
Eucalyptus globulus	33
Eucharis amazonica	33
Eugenia caryophyllata	33
Eugenia fruticosa	241, 259, 266, 307
Eugenia Heyneana	103
Eugenia Jambolana	33, 103, 182
Eugenia operculata	34, 103
Eulophia nuda	34, 140
Euphorbia antiquorum	34, 135
Euphorbia Bojeri	34
Euphorbia Chamaesyce	34
Euphorbia dracunculoides	34, 135
Euphorbia granulata	34
Euphorbia hirta	244, 336
Euphorbia hypericifolia	34, 135, 244, 335
Euphorbia microphylla	34, 135
Euphorbia neriifolia	135
Euphorbia Nivulia	135
Euphorbia pilulifera	34, 135, 188, 336
Euphorbia prolifera	34, 135
Euphorbia pulcherrima	135
Euphorbia scabrifolia	34
Euphorbia thymifolia	34, 135, 244, 336
Euphorbia Tirucalli	135
Euphorbia uniflora	335
Evolvulus alsinoides	34, 121
Exacum pedunculatum	118
Exacum petiolare	34, 118
Exacum tetragonum	34, 118
Excoecaria	248, 261
Excoecaria Agallocha	239, 243, 251, 339

F

Feronia elephantum	34, 88, 178
Ficus Arnottiana	138

PAGE.

Ficus bengalensis . . . 34, 138, 188
Ficus Benjamina 138, 340
Ficus cordifolia 310
Ficus Cunia 34, 139
Ficus gibbosa 35, 138
Ficus glomerata . . . 35, 139, 188
Ficus hispida 35, 139
Ficus indica 35
Ficus infectoria . . 138, 188, 242, 259, 340
Ficus nervosa 138
Ficus religiosa . 35, 138, 188, 242, 259, 340
Ficus retusa 35, 138, 254, 340
Ficus Roxburghii . . . 35, 139
Ficus Rumphii 138, 243, 246, 257, 258, 259, 340
Ficus scandens 35, 139
Ficus tomentosa 138
Ficus Tsiela 188
Fimbristylis æstivalis . . . 149
Fimbristylis dichotoma . . 149
Fimbristylis diphylla . . . 35, 149
Fimbristylis dipsacea . . . 149
Fimbristylis ferruginea . 35, 149, 246, 258, 352
Fimbristylis Hookeriana . . 149
Fimbristylis junciformis . . 35
Fimbristylis miliacea . . . 149
Fimbristylis monostachya 35, 149, 242, 259, 352
Fimbristylis podocarpa . . 149
Fimbristylis polytrichoides . 241, 260, 266, 352
Fimbristylis quinqueangularis . 149
Fimbristylis schœnoides . . 149
Fimbristylis squarrosa . . . 149
Fimbristylis sub-bispicata . . 246, 352
Fimbristylis tetragona . . . 149
Fimbristylis Thomsoni . . 149
Finlaysonia obovata . . . 248, 254, 318
Flacourtia Ramontchi . . . 35, 81
Flacourtia sepiaria . . 241, 259, 287
Flagellaria 261
Flagellaria indica . . 240, 256, 346
Flemingia bracteata . . . 98
Flemingia Chappar . . . 35, 98
Flemingia congesta . . 35, 231, 254, 300
Flemingia nana 98
Flemingia paniculata . . . 98
Flemingia semialata . . . 98
Flemingia stricta 35, 98
Flemingia strobilifera . . . 35, 98
Floscopa scandens . . . 145
Flueggia leucopyrus . . . 188
Flueggia microcarpa . . . 35, 136
Fœniculum vulgare . . . 107
Fragaria vesca 102
Fuirena glomerata . . . 150
Fuirena umbellata . . . 150

G

Galedupa indica 300
Galedupa uliginosa . . . 301
Garcinia Cowa 82
Gardenia gummifera . . . 35, 109
Gardenia latifolia . . . 36, 109
Gardenia turgida . . . 36, 109
Garnotia stricta 152
Garuga pinnata 36, 83, 178
Gastrochilus longiflora . . 141
Geaster 36, 159
Gelonium multiflorum . . . 36, 137
Geodorum dilatatum . . . 140
Geranium ocellatum . . . 36, 87
Girardinia zeylanica . . . 139
Gisekia pharnacioides . . . 182
Gleichenia dichotoma . . . 156
Globba bulbifera 141
Globba ophioglossa . . . 141
Globba orixensis 36, 141
Glochidion Heyneanum . . 36
Glochidion lanceolarium . . 36, 136
Glochidion multiloculare . . 136
Glochidion velutinum . . . 136
Gloriosa superba 36, 144
Glossocardia linearifolia . . 112, 183
Glossogyne pinnatifida . . 36, 113
Gloxinia sp. 37
Glycine hispida 95
Glycine Soja 37
Glycosmis pentaphylla . 87, 242, 259, 291
Gmelina arborea 37, 129
Gnaphalium indicum . . . 37, 112
Gnaphalium luteo-album . . 112
Gnaphalium pulvinatum . . 112
Gomphrena globosa . . . 132
Goniocaulon glabrum . . . 183
Goodyera procera . . . 141
Goona Grahami 97
Gossypium arboreum . . . 37
Gossypium herbaceum . . . 37 84
Gouania leptostachya . . . 37, 90
Gouania microcarpa . . . 37
Grangea maderaspatana . 111, 244, 261, 314
Gratiola Monniera . . . 325
Grewia asiatica 37, 86
Grewia cinnamomea . . . 86
Grewia excelsa 86
Grewia hirsuta 86
Grewia laevigata 37, 86
Grewia pilosa 37, 86, 178
Grewia polygama 37
Grewia populifolia . . . 178
Grewia salvifolia 37, 85
Grewia sapida 86
Grewia scabrophylla . . . 85
Grewia tiliæfolia 37, 85, 178
Grewia vestita 37, 86
Grewia villosa 37

PAGE.

Guizotia abyssinica . . . 38, 112, 183
Gymnema hirsutum . . . 117
Gymnopetalum cochinchinense . 106
Gymnosporia montana. . . 89
Gynandropsis pentaphylla . 39, 80 244, 286

H

Habenaria affinis 39, 141
Habernaria commelinifolia . . 141
Habenaria diphylla . . . 141
Habenaria galeandra . . . 39, 141
Habenaria goodyeroides . . 39, 141
Habenaria Lawii 39, 141
Habenaria marginata . . . 39, 141
Habenaria plantaginea . . 141
Habenaria platyphylla . . 39, 141
Habenaria stenopetala . . 39, 141
Habenaria Susannæ . . . 39, 141
Habenaria triflora . . . 141
Hamiltonia suaveolens . . 39, 110
Hedychium coccineum . . 39, 141
Hedychium coronarium . . 39, 141
Hedyotis hispida . . . 108
Hedyotis pinifolia . . . 108
Hedysarum arboreum . . . 298
Helicteres Isora 39, 85
Helinus lanceolatus . . . 90
Heliotropium indicum . . 119, 244, 322
Heliotropium marifolium . . 119
Heliotropium strigosum . . 32, 39, 119
Helminthostachys zeylanica . 364
Hemerocallis fulva . . . 144
Hemidesmus indicus . . 39, 117, 259, 318
Hemigraphis 243, 261
Hemigraphis hirta . . . 327
Hemigraphis latebrosa . . 39, 126
Hemionitis cordata . . . 157
Heptapleurum venulosum . . 39, 108
Heritiera Fomes 289
Heritiera littoralis . . . 250, 251
Heritiera minor . . 240, 248, 250, 251, 289
Herpestis 243, 261
Herpestis Hamiltoniana . . 39, 123
Herpestis Monniera . . . 123, 325
Heteropanax fragrans . . . 108
Heylandia latebrosa . . . 39, 93
Heynea trijuga 89
Hibiscus cancellatus . . . 39, 84
Hibiscus cannabinus . . . 40, 84
Hibiscus esculentus . . . 84
Hibiscus furcatus . . . 84
Hibiscus micranthus . . . 84
Hibiscus mutabilis . . . 84
Hibiscus pandurædformis . . 84, 177
Hibiscus populneus . . . 289
Hibiscus radiatus . . . 40
Hibiscus Rosa-sinensis . . 40, 84

PAGE.

Hibiscus Sabdariffa . . . 40, 84
Hibiscus tiliaceus . 177, 245, 247, 251, 255, 256, 289
Hibiscus tortuosus . . 231, 256, 268, 289
Hibiscus vitifolius . . . 84
Hiptage Madablota . . . 87
Holarrhena antidysenterica . . 40, 116
Holmskioldia sanguinea . . 40, 129
Holoptelea integrifolia . . 40, 138
Holostemma Rheedii . . . 40, 117
Homonoia riparia . . . 40, 137
Hoppea dichotoma . . 40, 118, 244, 320
Hordeum vulgare . . . 156
Hoya parasitica 247, 254, 320
Hoya pendula 117
Hydrilla 243
Hydrilla verticillata . . . 40, 139, 341
Hydrocotyle asiatica . . . 40, 107, 182
Hydrolea 243, 261
Hydrolea zeylanica . . . 118, 321
Hygrophila 243, 261
Hygrophila phlomoides . . 243, 259, 327
Hygrophila polysperma . . 126
Hygrophila quadrivalvis . . 126, 326
Hygrophila salicifolia . . . 40, 126
Hygrophila serpyllum . . 186
Hygrophila spinosa . . 40, 126, 186, 327
Hygrorhiza aristata . . . 152
Hymenodictyon excelsum . . 41, 108
Hypericum japonicum . . 82
Hypoxis aurea 143
Hyptianthera stricta . . . 41, 109
Hyptis suaveolens . . . 41, 130

I

Ichnocarpus frutescens . . 41, 117
Ichnocarpus ovalifolius . . 117
Ilysanthes hyssopoides . . 41, 123
Ilysanthes parviflora . . . 124
Impatiens Balsamina . . . 87
Imperata 256
Imperata arundinacea . . 41, 247, 261, 358
Imperata cylindrica . . . 152
Indigofera cordifolia . . . 94, 179
Indigofera echinata . . . 93
Indigofera enneaphylla . . 93
Indigofera glandulosa . . . 179
Indigofera hirsuta . . . 94
Indigofera linifolia . . . 41, 93, 179
Indigofera pentaphylla . . 94
Indigofera pulchella . . . 41, 94
Indigofera tinctoria . . . 41, 93
Indigofera trifoliata . . . 94
Indigofera trita 94
Intsia 247, 256
Intsia bijuga 303
Ionidium suffruticosum . . 41, 81

	PAGE.
Iphigenia indica	41, 144
Ipomœa aquatica	121, 185, 243, 261, 323
Ipomœa barlerioides	41, 120
Ipomœa Batatas	41, 120, 185
Ipomœa biloba	323
Ipomœa Bona-nox	41, 120
Ipomœa calycina	120
Ipomœa campanulata	323
Ipomœa chryseides	120
Ipomœa cymosa	41, 121
Ipomœa digitata	120, 323
Ipomœa eriocarpa	41, 120, 185
Ipomœa grandiflora	323
Ipomœa hederacea	41, 120
Ipomœa illustris	246, 256, 258, 323
Ipomœa longiflora	246, 323
Ipomœa muricata	41, 120
Ipomœa obscura	41, 120
Ipomœa paniculata	254, 323
Ipomœa Pes-capræ	246, 257, 323
Ipomœa Pes-tigridis	41, 120
Ipomœa petaloidea	121
Ipomœa phœnicea	120
Ipomœa polyantha	322
Ipomœa purpurea	42, 120
Ipomœa Quamoclit	42, 120
Ipomœa quinata	42, 121
Ipomœa reniformis	120, 185
Ipomœa reptans	323
Ipomœa semperflorens	42
Ipomœa sepiaria	42, 121, 185, 214, 261, 323
Ipomœa sessiliflora	42
Ipomœa speciosa	42
Ipomœa tridentata	42, 120
Ipomœa Turpethum	42, 121
Ipomœa vitifolia	42, 121
Isachne australis	42, 150
Isachne miliacea	42
Ischæmum angustifolium	42, 62, 153
Ischæmum aristatum	42
Ischæmum ciliare	42, 153
Ischæmum hirtum	42, 153
Ischæmum laxum	153
Ischæmum rugosum	42, 153
Iseilema Wightii	42, 154
Ixora coccinea	241, 259, 313
Ixora parviflora	42, 110, 246, 257, 313

J

	PAGE.
Jacquemontia violacea	121
Jasminum arborescens	42, 116
Jasminum pubescens	43, 116
Jasminum Roxburghianum	116
Jasminum Sambac	116
Jatropha Curcas	43, 137
Jatropha gossypifolia	43, 137
Jatropha multifida	137
Johnia coromandeliana	293
Jonesia triandra	303
Juncellus inundatus	351
Juncellus lævigatus	148
Juncellus pygmæus	148
Jussiæa repens	105
Jussiæa suffruticosa	43, 105
Justicia Betonica	43, 127
Justicia diffusa	43, 127
Justicia Gendarussa	127
Justicia procumbens	43, 127
Justicia quinqueangularis	43, 127
Justicia simplex	43, 127

K

	PAGE.
Kæmpferia rotunda	141
Kalanchoe floribunda	102
Kandelia	247, 250
Kandelia Rheedei	251, 306
Klernhovia hospita	232, 255, 290
Knoxia brachycarpa	109
Knoxia corymbosa	46, 109
Kydia calycina	47, 84
Kyllinga brevifolia	148
Kyllinga cylindrica	148
Kyllinga monocephala	47, 148
Kyllinga triceps	148, 242, 259, 350

L

	PAGE.
Lagarosiphon	243
Lagarosiphon Roxburghii	140, 341
Lagenaria vulgaris	48, 105
Lagerstrœmia indica	48, 104
Lagerstrœmia parviflora	48, 104
Laggera alata	111
Laggera aurita	111
Laggera flava	48, 111
Laggera pterodonta	111
Lantana Camara	128, 186
Lantana crenulata	48
Lantana indica	128, 261, 328
Lantana triflora	232
Lantana trifolia	261, 328
Lasia heterophylla	48, 147
Lathyrus Aphaca	48, 96
Lathyrus sativus	48, 96
Launæa aspleniifolia	48, 113
Launæa nudicaulis	114, 183
Launæa pinnatifida	183, 246, 257, 316
Lavandula Burmanni	130
Lawsonia alba	48, 104
Leea	254
Leea alata	91
Leea aspera	48, 91
Leea herbacea	91
Leea macrophylla	48, 91

	PAGE.
Leea robusta	91
Leea sambucina	48, 91, 295
Leersia	243
Leersia ciliata	357
Leersia hexandra	48, 152, 357
Lemna paucicostata	147
Leonotis nepetæfolia	48, 131
Lepidagathis fasciculata	127
Lepidagathis Hamiltoniana	127
Lepidagathis hyalina	48, 127
Lepidagathis purpuricaulis	127
Lepidagathis scariosa	49
Lepidagathis trinervis	127
Lepidium sativum	80
Leptadenia reticulata	184
Leptochloa chinensis	155
Leptochloa filiformis	155
Leptodesmia congesta	49, 94
Lespedeza sericea	96
Lettsomia aggregata	120
Lettsomia bella	49, 120
Lettsomia setosa	49, 120
Leucæna glauca	49, 100
Leucas aspera	49, 131, 186
Leucas Cephalotes	49, 131
Leucas Clarkei	49, 131
Leucas hyssopifolia	131
Leucas lanata	49, 131
Leucas linifolia	131, 244, 332
Leucas martinicensis	131
Leucas mollissima	49, 131
Leucas montana	49, 131
Leucas nutans	49, 131
Leucas pilosa	49
Leucas urticæfolia	49
Limnanthemum	243
Limnanthemum cristatum	49, 118, 184, 321
Limnanthemum indicum	49, 118
Limnophila conferta	49, 123
Limnophila diffusa	123
Limnophila gratioloides	49, 123
Limnophila gratissima	123, 241, 259, 325
Limnophila heterophylla	123
Limnophila racemosa	49, 123
Limnophila Roxburghii	123
Limnophila sessiliflora	49, 123
Limonia acidissima	87
Limonia pentaphylla	291
Linaria ramosissima	123
Lindenbergia urticæfolia	50, 123
Linociera intermedia	116
Linum usitatissimum	50, 86
Lipocarpha argentea	150
Lipocarpha sphacelata	50, 150
Lippia geminata	128, 246, 257, 261, 266, 328
Lippia nodiflora	128, 261, 328
Litsæa nitida	50, 134
Litsæa polyantha	134
Litsæa sebifera	50, 134
Lobelia affinis	114
Lobelia trialata	114
Lobelia trigona	50, 114, 183
Lonicera macrantha	103
Lophospermum scandens	123
Loranthus	247, 254
Loranthus bicolor	335
Loranthus cordifolius	134
Loranthus globosus	134, 335
Loranthus longiflorus	50, 134, 335
Loranthus Scurrula	50, 134, 335
Ludwigia parviflora	50, 105
Luffa acutangula	50, 106
Luffa amara	106
Luffa echinata	106
Luffa graveolens	106, 241, 310
Luisia	254
Luisia brachystachys	343
Luisia teretifolia	343
Luisia trichorhiza	140
Lumnitzera	247
Lumnitzera racemosa	307
Lycopodium	247, 254
Lycopodium Hamiltonii	158
Lycopodium Phlegmaria	365
Lycopersicum esculentum	69, 122
Lygodium flexuosum	158
Lygodium scandens	50

M

Mæsa indica	59
Malachra capitata	244, 288
Mallotus philippinensis	51, 137
Mallotus repandus	137, 232, 254, 338
Mangifera indica	51, 92
Mangifera oppositifolia	296
Manisuris granularis	153
Maranta arundinacea	142
Mariscus albescens	246, 256, 258, 351
Mariscus microcephalus	149
Marsilea minuta	158
Marsilea quadrifolia	51, 158
Martynia diandra	51, 125, 185
Maurandia Barclaiana	123
Mazus rugosus	52, 123
Melanthesopsis patens	19
Melastoma malabathricum	52, 104
Melia Azadirachta	52, 88, 178
Melia Azedarach	52, 88
Melochia corchorifolia	52, 85
Menispermum tomentosum	286
Menyanthes cristata	321
Merremia hederacea	232, 256, 322

	PAGE.
Mesua ferrea	82
Metroxylon Sagus	146
Mezoneuron cucullatum	99, 231, 254, 302
Michelia Champaca	52, 78
Microchloa setacea	155
Micromelum pubescens	53, 87, 254, 266, 291
Micromeria biflora	53, 131
Micromeria capitellata	131
Microstylis congesta	140
Milium ramosum	354
Miliusa velutina	53, 78
Millettia auriculata	53, 94
Millingtonia hortensis	125
Mimosa arabica	304
Mimosa concinna	305
Mimosa Intsia	305
Mimosa pudica	53, 101
Mimosa rubricaulis	53, 101
Mimosa scandens	304
Mimosa tomentosa	304
Mimusops Elengi	115
Mirabilis Jalapa	53, 131
Mitrasacme alsinoides	117
Mitreola oldenlandioides	53, 117
Mnesithea lævis	153
Mollugo hirta	107
Mollugo Spergula	107
Mollugo stricta	53, 107
Momordica Charantia	53, 106
Momordica dioica	53, 106, 182, 241, 310
Momordica monadelpha	311
Momordica umbellata	311
Mougeotia immersa	159
Monochoria hastæfolia	53, 144
Monochoria vaginalis	53, 144
Morinda	261
Morinda bracteata	243, 251, 313
Morinda tinctoria	53, 110
Moringa pterygosperma	53, 92, 179
Morus atropurpurea	54
Morus indica	54
Morus laevigata	54, 138
Mucuna gigantea	256, 298
Mucuna nivea	97
Mucuna pruriens	54, 96
Mucuna utilis	97
Mukia scabrella	54, 106
Murraya exotica	87
Murraya Kœnigii	87
Musa ornata	142
Musa rosacea	189
Musa sapientum	55, 142, 189
Musa superba	188
Mussaenda macrophylla	55, 109
Myriostachya	256
Myriostachya Wightiana	247, 360
Myrtus communis	103

N

	PAGE.
Naias	243
Naias dichotoma	350
Naias graminea	148
Naias minor	148, 350
Nama zeylanica	321
Naravelia zeylanica	245, 246, 257, 258, 285
Nasturtium indicum	79
Nasturtium officinale	79
Nelsonia campestris	55, 126
Nelumbium speciosum	79, 176
Nepeta ruderalis	131
Nephelium Lit-chi	55, 92
Nephrodium aridum	157, 244, 261, 362
Nephrodium cicutarium	157
Nephrodium cochleatum	157
Nephrodium falcilobum	157
Nephrodium Filix-mas	55
Nephrodium molle	157
Nephrodium odoratum	157
Nephrodium truncatum	55, 157
Nephrodium unitum	55, 157
Nephrodium variolosum	55, 157
Nerium odorum	55, 117
Nicotiana rustica	122
Nicotiana Tabacum	55, 122
Nipa	247, 251
Nipa fruticans	346
Nyctanthes Arbor-tristis	55, 116
Nymphæa Lotus	79, 176
Nymphæa stellata	79, 176

O

	PAGE.
Oberonia	254
Oberonia Falconeri	140
Oberonia Gammiei	342
Oberonia iridifolia	140
Ochna pumila	88
Ochna squarrosa	55
Ocimum Basilicum	55, 130, 244, 331
Ocimum canum	56, 129, 186
Ocimum gratissimum	56, 130
Ocimum pilosum	331
Ocimum sanctum	56, 130, 241, 244, 259, 331
Odina Wodier	56, 92, 241, 245, 246, 253, 257, 259, 296
Olax nana	56
Olax scandens	56, 89, 259, 293
Oldenlandia corymbosa	56, 109
Oldenlandia dichotoma	56, 109
Oldenlandia diffusa	109, 244, 312
Oldenlandia gracilis	56, 109
Oldenlandia Heynei	109
Oldenlandia nudicaulis	109
Oldenlandia senegalensis	56

PAGE.

Ophioglossum reticulatum . . 158
Ophioglossum vulgatum . . 56, 158
Oplismenus Burmanni . . 151
Oplismenus compositus . . 56, 151
Oplismenus undulatifolius . . 56
Opuntia Dillenii 107
Opuntia nigricans . . . 181
Ornithotrope glabra . . . 295
Orobanche indica . . . 57, 124
Oroxylum indicum . . . 57, 125
Orthosiphon pallidus . . . 130
Orthosiphon rubicundus . . 130
Orthosiphon stamineus . . 130
Orygia decumbens . . . 182
Oryza coarctata . . 232, 246, 247, 255, 256, 258, 357
Oryza granulata 152
Oryza sativa . 57, 152, 194, 244, 254, 356
Osbeckia chinensis . . . 57, 104
Osbeckia truncata . . . 57, 104
Osmunda zeylanica . . . 364
Ottelia 243
Ottelia alismoides . . . 57, 140, 342
Ougeinia dalbergioides . . 57, 95
Oxalis corniculata . 57, 87, 178, 244, 291
Oxystelma esculentum . 57, 244, 261, 318

P

Pachyrhizus angulatus . . 98
Pachystoma senile . . . 140
Pæderia fœtida 57, 110
Palmajuncus viminalis . . 203
Panax fruticosum . . . 108
Pancratium biflorum . . . 143
Pandanus fascicularis . 146, 192, 240, 248, 261, 348
Pandanus fœtidus . . . 266, 348
Pandanus odoratissimus . . 348
Panicum antidotale . . . 58, 151
Panicum auritum . . . 58
Panicum ciliare 58
Panicum colonum 58, 150, 193, 242, 259, 355
Panicum Crus-galli . 58, 150, 193, 261, 355
Panicum distachyum . . . 58, 150
Panicum flavidum . . . 58, 150, 193
Panicum glaucum 356
Panicum hispidulum . . . 355
Panicum humile 58, 151
Panicum indicum . . . 58, 151
Panicum interruptum . . . 58
Panicum Isachne . . . 58, 150
Panicum javanicum . . . 58, 194
Panicum maximum . . . 58, 151
Panicum miliaceum . . . 58, 151
Panicum miliare . . . 58, 151
Panicum montanum . . . 58, 151

PAGE.

Panicum myosuroides . . . 58, 151
Panicum Myurus . . . 150, 243, 355
Panicum nodosum . . . 58
Panicum paludosum . . . 355
Panicum plicatum . . . 151
Panicum proliferum . . 58, 151, 243, 355
Panicum prostratum . 58, 150, 193, 242, 259, 355
Panicum psilopodium . . . 58, 151
Panicum punctatum . . . 58, 150
Panicum ramosum . . . 58, 150
Panicum repens . 58, 151, 244, 261, 355
Panicum rhachitrichum . . 151
Panicum serrulatum . . . 355
Panicum setigerum . . . 58
Panicum trypheron . . . 59, 151, 194
Panicum uliginosum . . . 355
Panicum verticillatum . . 356
Panicum villosum . . . 59
Papaver somniferum . . . 79
Paramignya longispina . . 255, 256, 291
Parkinsonia aculeata . . 59, 99, 244, 302
Parsonsia spiralis . . . 248, 254, 318
Paspalum distichum . . 241, 260, 266, 354
Paspalum Kora 354
Paspalum longiflorum . . 59, 354
Paspalum pedicellare . . . 59
Paspalum Royleanum . . . 59
Paspalum sanguinale . . . 59
Paspalum scrobiculatum . 59, 150, 193, 243, 259, 261, 354
Passiflora suberosa . . . 261, 310
Pastinaca sativa 107
Pavetta indica 60, 110
Pavonia odorata 83
Pennisetum cenchroides . . 60, 152
Pennisetum orientale . . . 152
Pennisetum parviflorum . . 60, 152
Pennisetum pedicellatum . . 152
Pennisetum setosum . . . 60
Pennisetum typhoideum . . 60, 152, 194
Pentapetes phœnicia . . . 60, 85
Pentatropis microphylla . . 261, 319
Peperomia reflexa . . . 134
Peristrophe bicalyculata . . 60, 128
Perotis latifolia 60, 152
Petalidium barlerioides . . 126
Petaloma alternifolia . . 307
Petraea volubilis 129
Petunga Roxburghii . . . 232, 312
Peucedanum graveolens . . 107
Peucedanum nagpurensis . . 107
Phajus Wallichii . . . 140
Phaseolus aconitifolius . . 60, 97
Phaseolus adenanthus . 241, 251, 260, 299
Phaseolus alatus . . . 299
Phaseolus calcaratus . . . 60, 97

	PAGE.
Phaseolus Mungo	60, 97
Phaseolus trilobus	97, 180, 244, 299
Phaseolus trinervius	180
Phaseolus vulgaris	60, 97
Phaylopsis parviflora	126
Phlomis zeylanica	332
Phlox Drummondi	118
Phœnix acaulis	61, 146
Phœnix humilis	146
Phœnix paludosa	239, 247, 248, 251, 256, 347
Phœnix robusta	146
Phœnix sylvestris	61, 145, 192
Pholidota imbricata	140
Phragmites Karka	155, 240, 247, 256, 360
Phrynium capitatum	142
Phyllanthus bacciformis	336
Phyllanthus debilis	136
Phyllanthus Emblica	61. 136
Phyllanthus Lawii	136
Phyllanthus Niruri	61, 136, 244, 336
Phyllanthus pendulus	61, 136
Phyllanthus reticulatus	136
Phyllanthus simplex	61, 136
Phyllanthus urinaria	61, 136
Phyllanthus Vitis-Idæa	337
Physalis minima	61, 122
Physalis peruviana	122
Pimpinella elata	61
Pimpinella Heyneana	107
Pinus longifolia	139
Piper Betle	61, 134
Piper longum	61, 133
Pistia	243
Pistia Stratiotes	146, 243, 259, 349
Pisum arvense	96
Pisum sativum	96
Pladera pusilla	320
Plectranthus incanus	62, 130
Plectranthus ternifolius	130
Plesmonium margaritiferum	147
Pluchea indica	240, 260, 314
Plumbago capensis	62, 114
Plumbago zeylanica	62, 114
Plumeria acutifolia	62, 116
Poa plumosa	360
Poa procera	361
Pogonatherum saccharoideum	62, 153
Pogostemon plectranthoides	62, 130
Poinciana regia	62, 99
Poinsettia pulcherrima	62
Pollia sorzogonensis	62
Pollinia argentea	62, 153
Pollinia articulata	153
Pollinia ciliata	153
Polyalthia cerasoides	62, 78
Polyalthia longifolia	62, 78
Polycarpa corymbosa	62, 82
Polycarpa Lœflingiæ	82
Polygala chinensis	62, 81, 176
Polygala crotalarioides	62, 81
Polygala erioptera	62, 81
Polygala glaucoides	62
Polygala leptalea	81
Polygala triphylla	81
Polygonum acaule	417
Polygonum affine	392
Polygonum afghanicum	382
Polygonum alatum	133, 404
Polygonum alpinum	413
Polygonum amphibium	394
Polygonum amplexicaule	390, 391
Polygonum arifolium	411
Polygonum assamicum	397
Polygonum aviculare	379
Polygonum barbatum, *Linn.*	62, 133, 397
Polygonum barbatum, Roxb.	399, 403
Polygonum Bellardi	380
Polygonum biaristatum	378
Polygonum birmanicum	412
Polygonum Bistorta	390
Polygonum campanulatum	416
Polygonum capitatum	63, 133, 407
Polygonum chinense	63, 133, 408
Polygonum cognatum	378
Polygonum confusum	390
Polygonum Convolvulus	417
Polygonum cordifolium	392
Polygonum delicatulum	376
Polygonum dumetorum	418
Polygonum elegans	399
Polygonum Emodi	393
Polygonum filicaule	377
Polygonum flaccidum	399
Polygonum frondosum	414
Polygonum Gilesii	410
Polygonum glabrum	63, 133, 393
Polygonum glaciale	403
Polygonum hispidum	399, 403
Polygonum Hookeri	417
Polygonum humile	403
Polygonum Hydropiper	133, 401
Polygonum islandicum	376
Polygonum lanatum	399
Polygonum lanigerum	394
Polygonum lapathifolium	395
Polygonum limbatum	133, 387
Polygonum luzuloides	381
Polygonum macranthum	399, 403
Polygonum microcephalum	405
Polygonum minus	396
Polygonum mite	400
Polygonum molle	414
Polygonum molliaeforme	382
Polygonum muricatum	410

	PAGE.
Polygonum nodosum	396
Polygonum nummularifolium	417
Polygonum nutans	399
Polygonum orientale	386
Polygonum paleaceum	389, 390
Polygonum paniculatum	414
Polygonum paronychioides	379, 382
Polygonum pedunculare	413
Polygonum perfoliatum	379, 411
Polygonum perpusilum	389
Polygonum Persicaria	396
Polygonum pilosum	399
Polygonum plebejum	63, 133, 383
Polygonum polycnemoides	381, 382
Polygonum polystachyum	414, 415
Polygonum Posumbu	400
Polygonum prætermissum	412
Polygonum pterocarpum	418
Polygonum recumbens	378
Polygonum rivulare	399
Polygonum rude	414
Polygonum rumicifolium	415
Polygonum runcinatum	406
Polygonum sagittatum	411
Polygonum salicornioides	379
Polygonum senticosum	411
Polygonum serrulatum	399
Polygonum setosum	380
Polygonum sibiricum	417
Polygonum sinuatum	407
Polygonum speciosum	391
Polygonum sphærocephalum	406
Polygonum sphærostachyum	389, 390
Polygonum stagninum	133, 397, 398
Polygonum strigosum	411
Polygonum tenellum	399
Polygonum tomentosum	387, 399
Polygonum tortuosum	416
Polygonum tubulosum	381, 382
Polygonum vaccinifolium	393
Polygonum virginianum	388
Polygonum viscosum	397
Polygonum viviparum	388
Polygonum Wallichii	406
Polypodium adnascens	157, 254, 363
Polypodium glabrum	363
Polypodium irioides	254, 363
Polypodium membranaceum	157
Polypodium multilineatum	63, 157
Polypodium pertusum	363
Polypodium proliferum	63, 157, 244, 261, 363
Polypodium quercifolium	254, 363
Polypodium semisagittatum	362
Polypodium simplex	157
Polypodium stigmosum	157
Polypogon monspeliensis	155
Polyporus, sp.	159

	PAGE.
Polytoca barbata	152
Pongamia	247, 261
Pongamia glabra	63, 99, 243, 251, 300
Porana paniculata	63, 121
Portulaca oleracea	63, 82, 176, 244, 287
Portulaca quadrifida	63, 82, 176
Portulaca suffruticosa	177
Portulaca tuberosa	63, 82
Potamogeton crispus	63, 147
Potamogeton indicus	147
Potamogeton mucronatus	147
Potamogeton natans	63
Pouzolzia auriculata	139
Pouzolzia hirta	139
Pouzolzia indica	139
Pouzolzia pentandra	63, 139
Premna herbacea	63, 129
Premna integrifolia	240, 247, 261, 329
Premna latifolia	63, 129, 186
Premna serratifolia	329
Premna spinosa	329
Prenanthes aspleniifolia	316
Psidium Guyava	103, 244, 308
Psidium pomiferum	308
Psidium pyriferum	308
Psilotrichum	260
Psilotrichum ferrugineum	241, 266, 268, 333
Psilotum	247, 254
Psilotum triquetrum	365
Psoralea corylifolia	63, 94
Pteris angustifolia	363
Pteris biaurita	157
Pteris longifolia	157
Pteris lunulata	361
Pteris pellucida	157
Pteris piloselloides	364
Pteris scandens	364
Pteris succulenta	362
Pteris vittata	231, 254, 361
Pterocarpus Marsupium	64, 99
Pterospermum acerifolium	64, 85
Pterospermum suberifolium	64
Pueraria tuberosa	64, 97
Pulicaria angustifolia	64, 112
Punica Granatum	104
Pupalia atropurpurea	132
Putranjiva Roxburghii	64, 136
Pycreus capillaris	148
Pycreus latespicatus	148
Pycreus nitens	148
Pycreus polystachyus	241, 246, 258, 260, 350
Pygeum Andersoni	101
Pyrus communis	102

Q

Quisqualis indica	64, 103

PAGE.

R

Randia dumetorum . . . 64, 109, 182
Randia fasciculata . . . 109
Randia racemosa . . . 312
Randia uliginosa . . . 64, 109, 182
Raphanus sativus . . . 65, 80
Raphistemma pulchellum . . 117
Reinwardtia trigyna . . . 65, 86
Remusatia vivipara . . . 147, 192
Rhabdia lycioides . . . 119
Rhinacanthus communis . . 128
Rhizophora conjugata . . 306
Rhizophora gymnorhiza . . 307
Rhizophora Mangle . . . 305
Rhizophora mucronata . . 305
Rhizophora parviflora . . . 307
Rhus mysorensis 178
Rhyncocarpa fœtida . . . 182
Rhynchoglossum obliquum . . 125
Rhynchosia minima . . . 98
Rhynchostylis retusa . . . 140
Ricinus communis . . . 65, 137
Rivea hypocrateriformis . . 65, 119, 185
Rivea ornata 65, 119
Rosa centifolia 101
Rosa indica 101
Rosa involucrata . . . 65, 101
Rotang Pajare 214
Rothia trifoliata 179
Rottbœllia Clarkei . . . 153
Rottbœllia compressa . . . 153
Rottbœllia exaltata . . . 153
Rottlera dioica 338
Rubia cordifolia 110
Ruellia cernua 126
Ruellia hirta 327
Ruellia longifolia 327
Ruellia obovata 327
Ruellia prostrata 126
Ruellia suffruticosa . . . 65, 126
Rumex dentatus 65, 133
Rumex nigricans 65
Rungia parviflora . . . 66, 128
Ruppia 243
Ruppia rostellata . . . 349
Russelia juncea 66, 123

S

Saccharum arundinaceum . . 66, 152
Saccharum cylindricum . . 358
Saccharum Narenga . . . 66, 152
Saccharum officinarum . . 66, 153
Saccharum spontaneum 66, 152, 246, 247, 256, 257, 258, 358
Saccolabium 254

PAGE.

Saccolabium longifolium . . 343
Saccolabium ochraceum . . 343
Saccolabium papillosum . . 343
Saccolabium præmorsum . . 140
Saccopetalum tomentosum . . 66, 78
Sagittaria sagittæfolia . . . 66, 147
Salacia prinoides 256, 293
Salicornia 247
Salicornia brachiata . . . 231, 256, 333
Salicornia indica 333
Salix tetrasperma . . . 66, 139
Salomonia oblongifolia . . 66, 81
Salsola indica 333
Salvia plebeja 131
Salvinia cucullata . . . 158
Sansevieria Roxburghiana . . 66, 142
Santalum album 135, 187
Sapindus Danura 295
Sapindus Mukorossi . . . 66, 92
Sapindus trifoliatus . . . 92
Sapium indicum 338
Saponaria Vaccaria . . . 66, 82
Sarcanthus 254
Sarcanthus appendiculatus . . 344
Sarcanthus insectifer . . . 140, 344
Sarcolobus 261
Sarcolobus carinatus . . . 243, 256, 319
Sarcolobus globosus . . 243, 248, 256, 319
Sarcostemma brevistigma . . 117
Sauromatum guttatum . . . 66, 147, 192
Sauropus quadrangularis . . 136
Saussurea candicans . . . 67, 113
Schleichera trijuga . . . 67, 91
Schrebera swietenioides . . 116, 183
Scilla indica 114
Scindapsus officinalis . . . 67, 147
Scirpodendron 248, 256
Scirpodendron costatum . . 354
Scirpus 243, 261
Scirpus articulatus . . . 67, 149, 353
Scirpus erectus 67, 149
Scirpus globulosus . . . 352
Scirpus grossus . 67, 149, 193, 244, 247, 256, 353
Scirpus Isolepis 67, 150
Scirpus kyllingioides . . . 149
Scirpus littoralis 261, 353
Scirpus maritimus . . . 193
Scirpus Michelianus . . . 67, 150
Scirpus mucronatus . . . 67, 149
Scirpus pectinatus . . . 353
Scirpus schœnoides . . . 352
Scirpus spiralis 352
Scirpus squarrosus . . . 67, 150
Scirpus supinus 67, 149
Scirpus triqueter 232, 260, 353
Scleria caricina 67
Scleria elata 67

	PAGE
Scleria hebecarpa	67, 150
Scleria lithosperma	150
Scleria oryzoides	67
Scleria pergracilis	67, 150
Scleria tessellata	67, 150
Scoparia dulcis	67, 124, 244, 245, 325
Scorzonera divaricata	114
Scytalia Danura	295
Sebastiana Chamælea	67, 137
Selaginella pentagona	158
Selaginella proniflora	158
Selaginella rupestris	67, 158
Selaginella tenera	67
Semecarpus Anacardium	67, 92
Senebiera pinnatifida	244, 245, 286
Senna Sophora	303
Senna Tora	303
Serpicula verticillata	341
Serratula cinerea	313
Sesbania aculeata	68, 94
Sesbania ægyptiaca	68, 94, 180
Sesbania grandiflora	180, 244, 297
Seseli indicum	107
Sesamum indicum	68, 126
Sesuvium Portulacastrum	241, 246, 258, 311
Setaria glauca	68, 151, 194, 242, 259, 356
Setaria intermedia	151, 194
Setaria italica	68, 151
Setaria verticillata	68, 151, 244, 356
Shorea robusta	68, 83
Sida carpinifolia	68, 83
Sida cordifolia	83
Sida graveolens	288
Zida humilis	68, 83
Sida indica	288
Sida mysorensis	83
Sida rhombifolia	68, 83
Siegesbeckia orientalis	68, 112
Siphonanthus indica	330
Smilax aspera	69
Smilax macrophylla	69, 144, 190
Smilax prolifera	144
Smilax Roxburghiana	69, 144
Smilax zeylanica	69, 144
Smithia ciliata	94
Smithia conferta	94
Smithia sensitiva	69, 94, 180
Suæda fruticosa	187
Suæda maritima	240, 260, 333
Solanum argenteum	244, 324
Solanum diffusum	324
Solanum indicum	69, 122
Solanum Jacquini	324
Solanum Melongena	69, 122
Solanum nigrum	69, 121, 185, 244, 324
Solanum rubrum	324
Solanum torvum	121, 185
Solanum trilobatum	241, 260, 266, 325
Solanum tuberosum	63, 69, 121
Solanum verbascifolium	121
Solanum xanthocarpum	69, 122, 185, 244, 324
Sonchus arvensis	69, 113
Sonchus asper	113
Sonchus oleraceus	113, 183
Sonerila tenera	69, 104
Sonneratia acida	247, 248, 249, 309
Sonneratia apetala	240, 243, 247, 248, 249, 251, 261, 309
Sophora Bakeri	99
Sopubia delphinifolia	70, 124
Soymida febrifuga	70, 89
Spatholobus Roxburghii	70, 97
Spergula arvensis	82
Spergula pentandra	82
Spermacoce hispida	70, 110
Spermacoce stricta	70, 110
Sphæranthus africanus	241, 260, 266, 315
Sphæranthus indicus	70, 111, 315
Sphæromorphæa Russelliana	113
Sphenoclea zeylanica	114
Spilanthes Acmella	70, 112
Spinacia oleracea	133
Spondias Mangifera	70, 92
Sporobolus diander	70, 154
Sporobolus indicus	155
Sporobolus minutiflorus	195
Sporobolus tremulus	244, 359
Stachytarpheta indica	70, 128
Stemodia viscosa	123
Stephegyne parvifolia	70, 108
Sterculia colorata	70, 85
Sterculia urens	70, 85, 177
Sterculia villosa	71
Stereospermum suaveolens	71, 125
Stictocardia tiliæfolia	241, 251, 260, 322
Streblus asper	71, 138, 243, 259, 339
Striga euphrasioides	124
Striga lutea	124
Strobilanthes auriculatus	71, 126
Strobilanthes sabinianus	71, 126
Strychnos Nux-vomica	71, 118
Strychnos potatorum	71, 118
Stylidium tenellum	71, 114
Swertia affinis	118
Swertia pulchella	118
Symphorema polyandrum	129
Symplocos racemosa	71, 115
Synantherias sylvatica	192

T

Tabellaria flocculosa	159
Tabernæmontana coronaria	71, 116
Tacca pinnatifida	143
Tamarindus indica	71, 100, 181, 244, 303
Tamarix	257

PAGE.

Tamarix dioica 71
Tamarix ericoides . . . 71, 82
Tamarix gallica . . 240, 245, 254, 261, 287
Tecoma jasminoides . . . 72, 125
Tecoma stans 125
Tecoma velutina . . . 79
Tectona grandis . . . 72, 129
Tephrosia purpurea . . . 72, 94
Teramnus flexilis . . 232, 254, 266, 298
Teramnus labialis . . . 96
Terminalia Arjuna . . . 72, 102, 181
Terminalia belerica . . . 72, 102, 181
Terminalia Catappa . . . 72, 102
Terminalia Chebula . . . 72, 102
Terminalia tomentosa . . . 72, 89, 103
Thalictrum javanicum . . . 72, 77
Theriophorum Dalzellii . . 192
Thespesia Lampas . . . 72, 84
Thespesia populnea . . 245, 251, 258, 289
Thevetia neriifolia . . . 72
Thunbergia alata . . . 73, 126
Thunbergia fragrans . . . 126
Thunbergia grandiflora . . 73, 126
Thunbergia laurifolia . . 73, 126
Thunbergia tomentosa . . 126
Thysanolæna Agrostis . . 73, 151
Tinospora cordifolia . . . 286
Tinospora tomentosa . . . 241, 259, 286
Torenia cordifolia . . . 73, 123
Torenia peduncularis . . . 73
Torenia pedunculata . . . 123
Torenia varians 325
Tragia involucrata . . . 73, 137
Trapa bispinosa 105
Trema amboinensis . . . 73, 138
Trema orientalis . 73, 138, 242, 259, 339
Trema politoria 138
Trewia nudiflora . . 246, 257, 258, 261, 338
Trianthema decandra . . . 182
Trianthema monogyna . 107, 182, 244, 312
Trianthema obcordata . . 312
Trias 254
Trias oblonga 342
Tribulus terrestris . . . 87, 178
Trichodesma indicum . . 73, 119
Trichodesma zeylanicum . . 73, 119
Trichosanthes anguina . . 105
Trichosanthes cucumerina . . 244, 310
Trichosanthes palmata . . 105, 241, 310
Tridax procumbens . . 113
Trigonella Fœnum-græcum . 73
Tripogon capillatus . . . 155
Triticum vulgare . . . 156, 196
Triumfetta rhomboidea . . 73, 86
Trophis aspera 339
Tupistra aurantiaca . . . 73, 144
Turnera ulmifolia . . 74, 105, 244, 309

PAGE.

Typhonium divaricatum . . 192
Typhonium trilobatum . . 147, 192
Tylophora tennis . . . 244, 261, 320
Typha 244, 261
Typha angustata . . . 254, 349
Typha angustifolia . . . 349
Typha elephantina . . . 254, 349

U

Uraria alopecuroides . . . 95
Uraria hamosa 94
Uraria lagopoides . . . 74, 94
Uraria lagopus 74
Urena lobata 74, 84
Urena repanda 74, 84
Urena sinuata 74, 83
Utricularia 243
Utricularia bifida . . . 74, 124
Utricularia exoleta . . . 124
Utricularia fasciculata . . 326
Utricularia flexuosa . . . 124, 326
Utricularia hirta . . . 74, 124
Utricularia racemosa . . . 124
Utricularia stellaris . . . 124, 326

V

Vallaris dichotoma . . . 74
Vallaris Heynei 116
Vallisneria 243
Vallisneria alternifolia . . 341
Vallisneria spiralis . . . 140, 341
Vallisneria spiraloides . . 341
Vallisneria verticillata . . 341
Vanda parviflora . . . 140
Vanda Roxburghii . . . 74, 140
Vandellia angustifolia . . 123
Vandellia crustacea . . 74, 123, 244, 325
Vandellia erecta . . . 123
Vandellia Hookeri . . . 123
Vangueria spinosa . . 241, 259, 312
Vanilla planifolia . . . 74, 141
Ventilago calyculata . . . 74, 90
Verbena officinalis . . . 128
Verbesina calendulacea . . 315
Verbesina scandens . . . 315
Vernonia anthelmintica . . 74, 111
Vernonia cinerea 74, 110, 243, 244, 258, 259, 261, 313
Vernonia divergens . . . 111
Vernonia Roxburghii . . 74, 110
Vernonia teres 74, 110
Vicia Faba 74, 96
Vicia hirsuta 75, 96
Vicoa auriculata . . . 75, 112
Vigna Catjang 75, 98
Vigna luteola . 243, 245, 251, 258, 261, 299

PAGE.

Vigna vexillata 75, 98, 180
Vinca pusilla 75
Vinca rosea 75, 116
Viola odorota 81
Viola tricolor 81
Viscum 247, 254
Viscum articulatum . . . 75, 134
Viscum monoicum . . . 75, 134, 335
Viscum orientale . . . 75, 134
Vitex Negundo . . 75, 129, 246, 257, 329
Vitex peduncularis . . . 75, 129
Vitex trifolia . . . 75, 132, 246, 329
Vitis 254
Vitis adnata 75, 90
Vitis auriculata 91
Vitis carnosa 295
Vitis lanata 75, 90
Vitis lanceolaria 91
Vitis latifolia . . 73, 91, 243, 259, 294
Vitis quadrangularis . . . 294
Vitis tomentosa 75, 90
Vitis trifolia 243, 245, 248, 257, 258, 259, 261, 295
Vitis vinifera 75, 91
Vittaria 254
Vittaria elongata . . . 363
Volkameria neriifolia . . . 330
Volutarella divaricata . . . 113

W

Wahlenbergia gracilis . . 114
Waltheria indica . . . 85
Wedelia biflora 315
Wedelia calendulacea . 243, 261, 315
Wedelia scandens . . 243, 260, 315
Wedelia Wallichii . . . 75, 112

PAGE.

Wendlandia exserta . . . 75, 108
Wendlandia tinctoria . . . 75, 108
Woodfordia floribunda . . 76, 104
Wrightia tomentosa . . . 76, 117
Wulfia arhiza 147

X

Xanthium spinosum . . 244, 245, 315
Xanthium strumarium . . 112
Xylocarpus Granatum . . 293
Xylosma longifolium . . . 76, 81
Xyris pauciflora 76, 145

Y

Yucca aloifolia 76, 144

Z

Zea Mays 76, 152, 195
Zehneria Hookeriana . . . 76, 106
Zehneria umbellata . . 76, 107, 243, 311
Zephyranthes tubispatha . . 143
Zeuxine sulcata 141
Zingiber capitatum . . . 76, 142
Zingiber Casumunar . 76, 142, 241, 259, 344
Zingiber officinale . . . 76, 142
Zingiber rubens 142
Zingiber Zerumbet . . . 142
Zizyphus Jujuba . 76, 90, 178, 244, 294
Zizyphus Oenoplia . 76, 90, 241, 259, 294
Zizyphus oxyphylla . . . 76
Zizyphus rugosa . . . 76, 90
Zizyphus vulgaris . . . 90
Zizyphus xylospyrus . . . 76, 90
Zornia diphylla 76, 94
Zoysia 260
Zoysia pungens . . 241, 246, 258, 357

G. I. G P. O.—No. 2586 R. & A.—2-1-1904.—450.—C. P.